



United States
Department of
Agriculture

In cooperation with South
Dakota Agricultural
Experiment Station

Soil Survey of Spink County, South Dakota



Natural
Resources
Conservation
Service



The soil properties and interpretations included in this survey were current as of July 2008. The most current information is available through the Natural Resources Conservation Service Soil Data Mart Website at <http://soildatamart.nrcs.usda.gov/> and/or the Natural Resources Conservation Service Web Soil Survey at <http://websoilsurvey.nrcs.usda.gov/app>.



How to Use This Soil Survey

General Soil Map

The general soil map, which is a color map, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

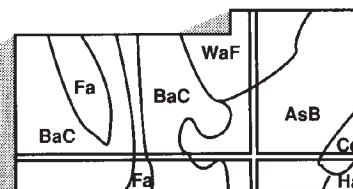
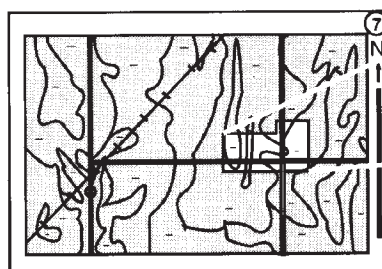
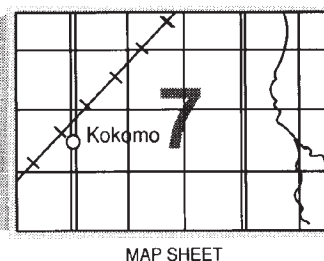
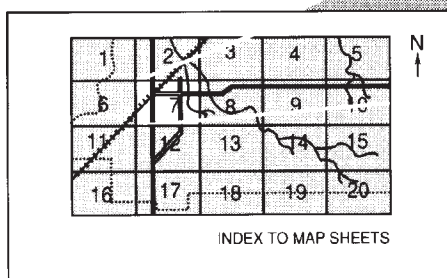
Detailed Soil Maps

The detailed soil maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**. Note the number of the map sheet and click on that sheet.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.



NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service, formerly the Soil Conservation Service, has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1996. Soil names and descriptions were approved in 1996. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1996. This survey was made cooperatively by the Natural Resources Conservation Service and the South Dakota Agricultural Experiment Station at South Dakota State University. The survey is part of the technical assistance furnished to the Spink County Conservation District. Some financial assistance was furnished by Spink County.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

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Cover: An area of Ludden silty clay, 0 to 1 percent slopes, along the James River flood plain in northern Spink County.

Additional information about the Nation's natural resources is available online from the Natural Resources Conservation Service at <http://www.nrcs.usda.gov>.

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Foreword

This soil survey contains information that can be used in land-planning programs in this county. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for optimum food and fiber production while protecting our soil, water, air, plants, and animal resources. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations that affect various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too stony to cultivate. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the county is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service, South Dakota Experiment Station at South Dakota State University, or the Cooperative Extension Service.

Janet L. Oertley
State Conservationist
Natural Resources Conservation Service

Where to Get Updated Information

The soil properties and interpretations included in this survey were current as of July 2008. The most current information is available through the Natural Resources Conservation Service Soil Data Mart Website at <http://soildatamart.nrcs.usda.gov/> and/or the Natural Resources Conservation Service Web Soil Survey at <http://websoilsurvey.nrcs.usda.gov/app>.

Additional information is available from the Natural Resources Conservation Service Field Office Technical Guide in Redfield, South Dakota, or online at www.nrcs.usda.gov/technical/efotg. The data in the Field Office Technical Guide are updated periodically.

Additional information about soils and about NRCS is available through the South Dakota NRCS Web page at www.sd.nrcs.usda.gov.

For further information please contact:

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Soil Survey of Spink County, South Dakota

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United States Department of Agriculture, Natural Resources Conservation Service,
in cooperation with
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Spink County is in the northeastern part of South Dakota (fig. 1). It has a total area of 965,958 acres or about 1,512 square miles. This acreage includes about 5,717 acres of water.

About 71 percent of the acreage in the county is cropland, 22 percent is rangeland, and 7 percent is tame pasture and hay (USDC, 1997). Corn, soybeans, spring wheat, and sunflowers are the major crops. Growing cash crops and hay and raising beef cattle are the main farm enterprises.

This soil survey updates the soil survey of Spink County published in 1954 (Westin, et. al., 1954). It provides additional information and has larger maps, which show the soils in greater detail.

General Nature of the County

This section gives general information concerning the county. It describes climate; physiography, relief, and drainage; settlement; farming; and natural resources.

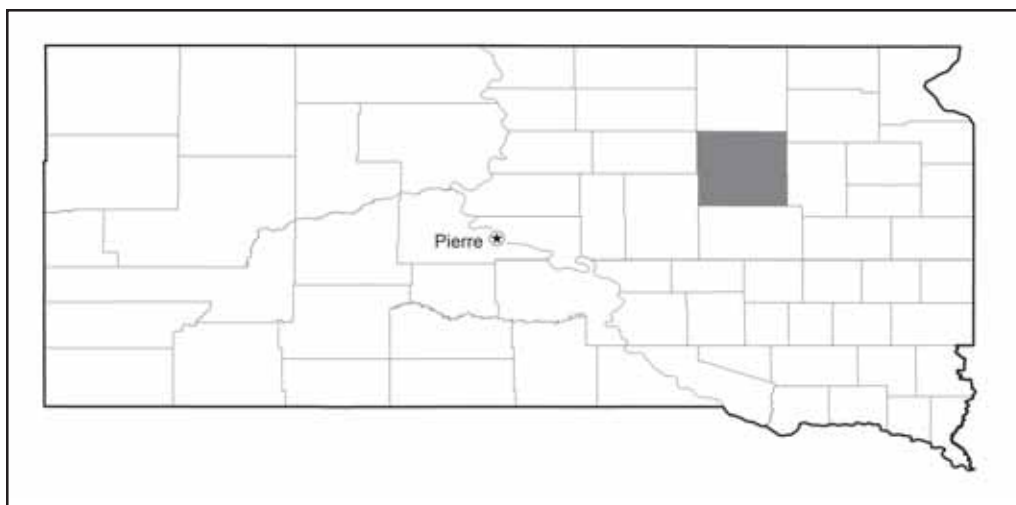


Figure 1. Location of Spink County in South Dakota.

Climate

Prepared by the Natural Resources Conservation Service Water and Climate Center, Portland, Oregon.

The "Temperature and Precipitation" table gives data on temperature and precipitation for the survey area as recorded at Redfield, South Dakota for the period 1971 to 2000. The "Freeze Dates in Spring and Fall" table shows probable dates of the first freeze in fall and the last freeze in spring. The "Growing Season" table provides data on length of the growing season.

In winter, the average temperature is 15.2 degrees F and the average daily minimum temperature is 4.7 degrees. The lowest temperature on record, which occurred on February 9, 1994, is -47 degrees. In summer, the average temperature is 70.1 degrees and the average daily maximum temperature is 83.4 degrees. The highest recorded temperature, which occurred on August 13, 1965, is 114 degrees.

Growing degree days are shown in the "Temperature and Precipitation" table. They are equivalent to "heat units". During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is about 20 inches. Of this, 13 inches, or 66 percent, usually falls in May through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 7 inches. The heaviest one-day rainfall during the period of record was 3.84 inches on June 17, 1992. Thunderstorms occur on about 40 days each year, and most occur in June.

The average seasonal snowfall is about 31 inches. The greatest snow depth at any one time during the period of record was 30 inches. On the average, 62 days of the year have at least 1 inch of snow on the ground, but the number of such days varies greatly from year to year. The heaviest one-day snowfall on record was 18 inches on February 18, 1962.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 84 percent. The sun shines 66 percent of the time possible in summer and 40 percent in winter. The prevailing wind is from the south-southwest. Average windspeed is highest, 13 miles per hour, in April and May.

Physiography, Relief, and Drainage

Spink County is in the James River Lowland physiographic division (Flint, 1955). The major landforms are lake plain, glacial uplands, glacial outwash, and alluvial flood plains.

The central and north-central part of the county is a nearly flat plain that lies between 1,290 to 1,310 feet above sea level. The plain is the former bed of an extensive, shallow, and short-lived, glacial lake known as Lake Dakota (Flint, 1955). This lake was about 90 miles long and 27 miles wide. It extended from southern Spink County to about 15 miles north of the North Dakota-South Dakota state line. The materials of the lake bed of Lake Dakota consist primarily of silt with lesser amounts of fine sand and clay and are thought to have been brought to the area by streams flowing from a melting glacier and then deposited in standing water. There is also evidence of the presence of old beach lines, which run parallel to the eastern

edge of the lake bed. The most evident beach line areas are 2 miles west of Turton (NE 1/4 sec. 11 T. 118 N. R. 61 W.) and 2 miles south and 2 miles west of Turton (NE 1/4 sec. 23 T. 118 N. R. 61 W.). The beach ridges are about 20 feet high, but this does not indicate the depth of the water of Lake Dakota as evidence suggests that deposition of lacustrine deposits continued in the central part of the lake plain after the outer margins were established. The thickness of the laminations (varves) indicates that the deposition into the lake plain was rapid in the early stages and then much slower in the later stages. The lake plain does not have a well developed natural drainage system except for those areas near the James River, Dry Run Creek, Mud Creek, and Timber Creek. As the lake bed decreased in size, the area with more slope developed more channels than the flatter areas and thus more readily rid itself of water. The flatter areas lost more water by evaporation than runoff. The standing water on the flatter areas favored the settling out of finer material along with the sodium salts. This is the reason why the less productive soils (high clay content and sodium salts) within the lake plain boundaries are located away from established drainageways. The concentrations of boulders in south-central Spink County along the James River are a result of the drainage of the lake plain. The outflowing water eroded the glacial till, but was unable to remove the boulders it discovered.

The glacial uplands lie east, south, and west of the lake plain. They consist of deposits of glacial till that form a nearly level landscape with the exception of three prominent hills: Bald Mountain (6 miles west of Redfield); Redfield Hills (south and east of Redfield); and Doland Ridge (a north-south trending ridge about 12 miles long running parallel to the lake plain west of Doland). These three features are remnants of major prediversion divides of glacial activity (Flint, 1955). Many potholes or closed depressions dot the landscape and collect most of the surface runoff from the higher lying land. The drainage pattern is poorly defined.

The glacial outwash is scattered throughout Spink County, but the major area is located in southwestern corner of the county. The deposits of sands and gravels were laid down by streams entering from the west and northwest as the water flowed south and east towards the James River.

Flood plains are along the major streams. The James River flood plain is 30 to 70 feet below the level of the Lake Dakota plain and ranges from .25 to .75 miles in width. The James River and its tributaries form the natural drainage network of Spink County; it flows southward at a low gradient across the county. The principal tributaries to the James River are Dry Run Creek, Mud Creek, Snake Creek, Timber Creek, and Turtle Creek. Foster Creek drains the southeastern part of Spink County and joins the James River in northern Beadle County.

The major natural lakes in Spink County are Cottonwood Lake and Twin Lakes, which are both located in the southwestern part of the county.

Settlement

Spink County was created in 1873 by the Dakota Territory Legislature. Organization of the county took place August 1, 1879 and the first county election was held the following year. The county was named in honor of S.L. Spink a territorial secretary and delegate to Congress (SDCLRS, 1968).

The settlement of the county was very slow prior to 1880. No mass movement to settle the county was made until the railroads decided to extend their lines westward. By 1890 the county had over 10,000 residents (SDCLRS, 1968).

The population of the county has been declining since the early 1900's. Redfield is the county seat. Other towns and communities are Ashton, Brentford, Conde, Doland, Frankfort, Mellette, Northville, Tulare, and Turton.

The county is served by United States highways 212 and 281, and by South Dakota state highways 20, 26, 28, and 37. In addition, roads are located on most section lines. Most rural areas are served by all weather roads to centers of trade. Railroad service is provided by the Dakota, Minnesota, and Eastern Railroad and by the Burlington Northern Railroad. A municipal airport is located at Redfield.

Farming

Farming is the principle enterprise in Spink County. Cash crops are the main source of income, but income from livestock and livestock products are also important.

In 1997, there were 647 farms in the county. The farms averaged about 1,313 acres in size (USDC, 1997). The trend is for fewer and larger farms.

About 78 percent of the acreage in the county is used for cultivated crops or for tame pasture or hay, and about 22 percent is rangeland (USDA, 1987). Dryland farming is dominant; however, in 1997 about 14,000 acres were irrigated in scattered areas throughout the county (USDC, 1997). All irrigation is by the sprinkler method. Corn, spring wheat, soybeans, and sunflowers are the main cultivated crops. Alfalfa, intermediate wheatgrass, and smooth brome grass are the main crops grown for hay.

The Spink County Soil Conservation District was organized in 1941 to provide assistance to landowners and others interested in conservation of soil and water. Since then, its purpose and concerns have expanded to include conservation of all natural resources.

Natural Resources

Soil is the most important natural resource in the county. "Out of the long list of nature's gift to man, none is perhaps so utterly essential to human life as soil". (H.H. Bennett, 1939). Soil provides a growing medium for crops, grasses, forbs, and trees. Other natural resources are water, sand and gravel, and wildlife.

The water resources of Spink County consist of the surface water of the James River and its tributaries, Cottonwood Lake, Lake Dudley, Lake Redfield, Mirage Lake, and Twin Lakes; and the ground water of the aquifers in glacial deposits of sand and gravel and sandstone bedrock (Hamilton and Howells, 1996). The surface waters, which occupy about 1 percent of the county, are used for a combination of purposes such as fish life propagation, recreation, wildlife propagation, and livestock watering. The James River and its tributaries have highly varied flows and mainly flow during periods of snowmelt and high rainfall. At Ashton, the annual flow of the James River is 113,700 acre-feet (157 cubic feet per second) with a high of 462,800 acre-feet in 1969 and a low of 29,460 acre-feet in 1974. Except for Dry Run, all the tributaries of the James River contain segments where the stream channel is below the local water table and thus pools of permanent water exist. The aquifers provide the principle source of water for irrigation (72 percent) along with being a main water source for livestock (22 percent). Spink County is ranked second among South Dakota counties in the volume of ground water used for irrigation (Hamilton and Howells, 1996). There are seven major aquifers in Spink County; (Tulare, Elm, Altamont, Middle James, and Deep James in glacial aquifers and Niobrara and Dakota in bedrock aquifers).

The glacial aquifers, which underlie about half of the county, are generally suited for irrigation, but caution must be used as the quality of the water varies widely, both within and between aquifers. The Tulare Aquifer provides 88 percent of the water used for irrigation in Spink County.

The bedrock aquifers, which underlie most of the county, are unsuited for irrigation, but do supply water for livestock use. The vast majority (85 percent) of this water from bedrock aquifers is unused flow from the wells. Dugouts in areas of Parnell, Southam, Tetonka, Tonka, and Worthing soils provide additional water for livestock and wildlife.

Sand and gravel are deposited in scattered areas throughout the southern and eastern parts of the county in the glacial till deposits. The major sand and gravel deposit is located in the southwestern part of Spink County, mainly in southern Redfield, northern Tulare, Lake, and western Buffalo Townships (Schulz, 1995). Small pockets of sand and gravel are also located along Snake Creek in northern Northville Township, along South Fork Snake Creek in Athol Township, and along Dove Creek in Groveland Township. Sand and gravel deposits are not likely to occur in areas of deep lake silt located in central and north central parts of the county. Most of the sand and gravel deposits contain materials with a wide range in grain size and silt and sand content.

How This Survey Was Made

This survey was made to provide information about the soils in the county. The information includes a description of the soils, their location, and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; and the kinds of crops and native plants. They dug many holes to study the soil profile, the sequence of natural layers or horizons in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils in the county are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil is associated with a particular kind of landform or with a segment of the landform. By observing the soils in the county and relating their position to specific segments of the landform, a soil scientist develops a concept or model of how the soils formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationships, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted color, texture, size, and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify and classify soils. After describing the soils in the county and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States (USDA, 1999), is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the county, they compared the individual soils with similar soils in the same taxonomic class in other areas so

that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests, as well as the field-observed characteristics and the soil properties, to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the county, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, which help in accurately locating boundaries.

The descriptions, names, and delineations of the soils and soil mapping units in this county do not fully agree with those of the soils and mapping units in adjacent published surveys of Beadle, Faulk, and Hand Counties. Differences are the result of a better knowledge of soils, modifications in series concepts, or variations in the intensity of mapping or in the extent of the soils in the county.

General Soil Map Units

The general soil map shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, each general soil map unit consists of one or more major soils and some minor soils or miscellaneous areas. Each soil map unit is usually named for the major soils present in the unit. The components of one map unit can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of the general soil map's small scale, it is not suitable for planning the management of a farm, or field, or for selecting a site for a road or building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

The soils in the associations are in different landform positions (fig. 2). These different landform positions affect such things as the amount of topsoil, drainage classes, runoff, productivity, and organic matter.

LEVEL TO MODERATELY SLOPING, SILTY AND LOAMY SOILS ON MOIST, COOL ** LAKE PLAINS AND SILTY AND CLAYEY SOILS ON FLOOD PLAINS (MLRA-55B)****

These soils formed in glaciolacustrine sediments and alluvium. The slopes are level to moderately sloping. These soils make up about 45 percent of the county. Most areas are used for cultivated crops, except for the Aberdeen-Exline-Harriet association which is used primarily for pastureland, hayland, or rangeland. Conserving moisture, controlling water erosion on slopes greater than 2 percent, sodium-affected subsoils, and slow and very slow permeability are the main management concerns. Flooding, high water tables, high content of lime which adversely affects the availability of plant nutrients, wind erosion, and compaction are management concerns on the Ludden and Lamoure soils.

1. Gardena-Eckman Association

Moderately well drained and well drained, nearly level to gently sloping, silty soils on lake plains

Percent of survey area: 1 percent

Composition

Gardena and similar soils: 40 percent

Eckman and similar soils: 35 percent

Minor soils: 25 percent

Setting

Landform position: Gardena - footslopes; Eckman - summits and backslopes

Slope range: Gardena - 0 to 2 percent; Eckman - 0 to 6 percent

Soil Properties and Qualities

Texture of the surface layer: Gardena - silt loam; Eckman - silt loam

Drainage class: Gardena - moderately well drained; Eckman - well drained

Depth to restrictive feature: Gardena - none; Eckman - none

Depth to contrasting parent material: Gardena - greater than 60 inches;
Eckman - greater than 60 inches

Depth to water table: Gardena - 3 to 6 feet; Eckman - greater than 6 feet

Flooding: Gardena - none; Eckman - none

Ponding: Gardena - none; Eckman - none

Permeability: Gardena - moderate in the solum and moderate to slow in the underlying material; Eckman - moderate in the solum and moderate to slow in the underlying material

Available water capacity: Gardena - high; Eckman - high

Organic matter content: Gardena - high; Eckman - moderate

Surface runoff: Gardena - low; Eckman - low or medium

Minor Soils

Somewhat poorly drained Bearden soils which are calcareous at or near the surface on footslopes

Moderately well drained Camtown soils which have a sodium-affected subsoil on summits and backslopes

Moderately well drained Glyndon soils which are calcareous at or near the surface

Poorly drained Tonka soils in basins

Moderately well drained Turton soils which have a sodium-affected subsoil that has greater amount of exchangeable Na. than the Camtown soils on footslopes

Use and Management

Major land use: About 95 percent is cropland

Other land use: About 5 percent is pasture and hayland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Management concerns: Gardena - few limitations except to conserve moisture; Eckman - water erosion on slopes greater than 2 percent. Minor soils can have significant management concerns. Review the detailed descriptions to determine if the minor soils will limit or affect the intended use of this soil association.

2. Great Bend-Beotia Association

Well drained, nearly level to moderately sloping, silty soils on glacial lake plains (fig. 2)

Percent of survey area: 9 percent

Composition

Great Bend and similar soils: 45 percent

Beotia and similar soils: 30 percent

Minor soils: 25 percent

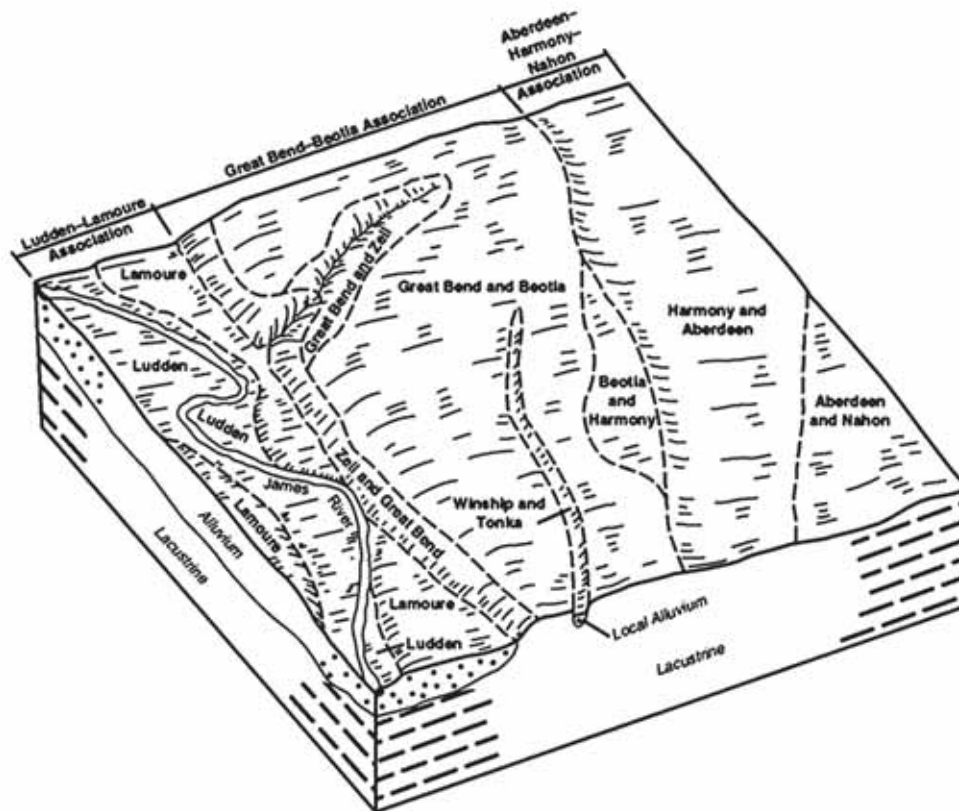


Figure 2. Pattern of soils and underlying materials in the Great Bend-Beotia, Aberdeen-Harmony-Nahon, and Ludden-Lamoure associations.

Setting

Landform position: Great Bend - summits and backslopes; Beotia - footslopes

Slope range: Great Bend - 0 to 9 percent; Beotia - 0 to 2 percent

Soil Properties and Qualities

Texture of the surface layer: Great Bend - silt loam; Beotia - silt loam

Drainage class: Great Bend - well drained; Beotia - well drained

Depth to restrictive feature: Great Bend - none; Beotia - none

Depth to contrasting parent material: Great Bend - greater than 60 inches;
Beotia - greater than 60 inches

Depth to water table: Great Bend - greater than 6 feet; Beotia - greater than 6 feet

Flooding: Great Bend - none; Beotia - none

Ponding: Great Bend - none; Beotia - none

Permeability: Great Bend - moderate in the solum and moderate to slow in the underlying material; Beotia - moderate in the solum and moderate to slow in the underlying material

Available water capacity: Great Bend - high; Beotia - high

Organic matter content: Great Bend - moderate; Beotia - high

Surface runoff: Great Bend - low or medium; Beotia - low

Minor Soils

Moderately well drained Aberdeen soils which have a sodium-affected subsoil on footslopes

Moderately well drained Harmony soils which have more clay and less silt in the subsoil on footslopes

Poorly drained Tonka soils in basins

Somewhat poorly drained Winship soils which are dark to a depth greater than 30 inches on toeslopes

Well drained Zell soils which are calcareous to the surface on shoulders

Use and Management

Major land use: About 95 percent is cropland

Other land use: About 5 percent is pasture and hayland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Management concerns: Great Bend - water erosion on slopes greater than 2 percent; Beotia - few limitations except to conserve moisture. Minor soils can have significant management concerns. Review the detailed descriptions to determine if the minor soils will limit or affect the intended use of this soil association.

3. Great Bend-Beotia-LaDelle Association

Well drained and moderately well drained, nearly level to moderately sloping, silty soils on glacial lake plains and flood plains

Percent of survey area: 8 percent

Composition:

Great Bend and similar soils: 35 percent

Beotia and similar soils: 25 percent

LaDelle and similar soils: 15 percent

Minor soils: 25 percent

Setting

Landform position: Great Bend - summits and back slopes; Beotia - footslopes; LaDelle - low flood plains

Slope range: Great Bend - 0 to 9 percent; Beotia - 0 to 2 percent; LaDelle - 0 to 2 percent

Soil Properties and Qualities

Texture of the surface layer: Great Bend - silt loam; Beotia - silt loam; LaDelle - silt loam

Drainage class: Great Bend - well drained; Beotia - well drained; LaDelle - moderately well drained

Depth to restrictive feature: Great Bend - none; Beotia - none; LaDelle - none

Depth to contrasting parent material: Great Bend - greater than 60 inches; Beotia - greater than 60 inches; LaDelle - greater than 60 inches

Depth to water table: Great Bend - greater than 6 feet; Beotia - greater than 6 feet; LaDelle - 3.5 to 5 feet

Flooding: Great Bend - none; Beotia - none; LaDelle - frequent for brief periods

Ponding: Great Bend - none; Beotia - none; LaDelle - none

Permeability: Great Bend - moderate in the solum and moderate to slow in the underlying material; Beotia - moderate in the solum and moderate to slow in the underlying material; LaDelle - moderate

Available water capacity: Great Bend - high; Beotia - high; LaDelle - high

Organic matter content: Great Bend - moderate; Beotia - high; LaDelle - high

Surface runoff: Great Bend - low or medium; Beotia - low; LaDelle - low

Minor Soils

Moderately well drained Aberdeen soils which have a sodium-affected subsoil on footslopes
 Well drained, loamy Buse and silty Zell soils which are calcareous to the surface on shoulders
 Moderately well drained Harmony soils which have more clay and less silt in the subsoil on lower backslopes and footslopes
 Somewhat poorly drained Ranslo soils which have a sodium-affected subsoil on high flood plains
 Poorly drained Tonka soils in basins
 Somewhat poorly drained Winship soils which are dark to a depth greater than 30 inches on toeslopes

Use and Management

Major use: About 80 percent is cropland
Other use: About 20 percent is pasture and hayland
Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers
Management concerns: Great Bend - water erosion on slopes greater than 2 percent; Beotia - few limitations except to conserve moisture; LaDelle - few limitations except to conserve moisture, except when flooding occurs and where channeled, machinery use is severely limited. Minor soils can have significant management concerns. Review the detailed descriptions to determine if the minor soils will limit or affect the intended use of this soil association.

4. Aberdeen-Harmony-Nahon Association

Moderately well drained, nearly level, silty soils and moderately well drained, nearly level, sodium-affected, silty soils; on lake plains (fig. 2)

Percent of survey area: 14 percent

Composition

Aberdeen and similar soils: 35 percent
 Harmony and similar soils: 25 percent
 Nahon and similar soils: 15 percent
 Minor soils: 25 percent

Setting

Landform position: Aberdeen - footslopes; Harmony - summits and backslopes; Nahon - footslopes

Slope range: Aberdeen - 0 to 2 percent; Harmony - 0 to 2 percent; Nahon - 0 to 2 percent

Soil Properties and Qualities

Texture of the surface layer: Aberdeen - silt loam or silty clay loam; Harmony - silt loam or silty clay loam; Nahon - silt loam or silty clay loam

Drainage class: Aberdeen - moderately well drained; Harmony - moderately well drained; Nahon - moderately well drained

Depth to restrictive feature: Aberdeen - none; Harmony - none; Nahon - natric-top depth ranges from 6 to 17 inches

Depth to contrasting parent material: Aberdeen - greater than 60 inches; Harmony - greater than 60 inches; Nahon - greater than 60 inches

Depth to water table: Aberdeen - 3.5 to 5 feet; Harmony - 3.5 to 5 feet; Nahon - 3.5 to 5 feet

Flooding: Aberdeen - none; Harmony - none; Nahon - none

Ponding: Aberdeen - none; Harmony - none; Nahon - none

Permeability: Aberdeen - slow; Harmony - moderately slow in the solum and moderate to slow in the underlying material; Nahon - very slow

Available water capacity: Aberdeen - high; Harmony - high; Nahon - moderate

Organic matter content: Aberdeen - moderate; Harmony - high; Nahon - moderate

Surface runoff: Aberdeen - low; Harmony - low; Nahon - low

Minor Soils

Well drained and moderately well drained Beotia and well drained Great Bend soils which have more silt and less clay in the subsoil on footslopes, summits, and backslopes

Somewhat poorly drained Exline soils which have visible salts within a depth of 16 inches on lower footslopes

Poorly drained Heil and Tonka soils in basins

Somewhat poorly drained Winship soils which are dark to a depth greater than 30 inches on toeslopes

Use and Management

Major use: About 75 percent is cropland

Other use: About 25 percent is pasture and hayland

Main crops: Spring wheat, alfalfa, sunflowers, corn, and soybeans

Management concerns: Aberdeen - sodium-affected subsoil adversely affects crop growth by restricting root penetration, slow permeability; Harmony - few limitations except to conserve moisture; Nahon - sodium-affected subsoil adversely affects crop growth by restricting root penetration, very slow permeability. Minor soils can have significant management concerns. Review the detailed descriptions to determine if the minor soils will limit or affect the intended use of this soil association.

5. Nahon-Aberdeen-Exline Association

Moderately well drained and somewhat poorly drained, nearly level, sodium-affected, silty soils on glacial lake plains (fig. 3)

Percent of survey area: 13 percent

Composition

Nahon and similar soils: 30 percent

Aberdeen and similar soils: 30 percent

Exline and similar soils: 20 percent

Minor soils: 20 percent

Setting

Landform position: Nahon - footslopes; Aberdeen - summits and backslopes; Exline - footslopes

Slope range: Nahon - 0 to 2 percent; Aberdeen - 0 to 2 percent; Exline - 0 to 2 percent

Soil Properties and Qualities

Texture of the surface layer: Nahon - silt loam; Aberdeen - silt loam; Exline - silt loam

Drainage class: Nahon - moderately well drained; Aberdeen - moderately well drained; Exline - somewhat poorly drained

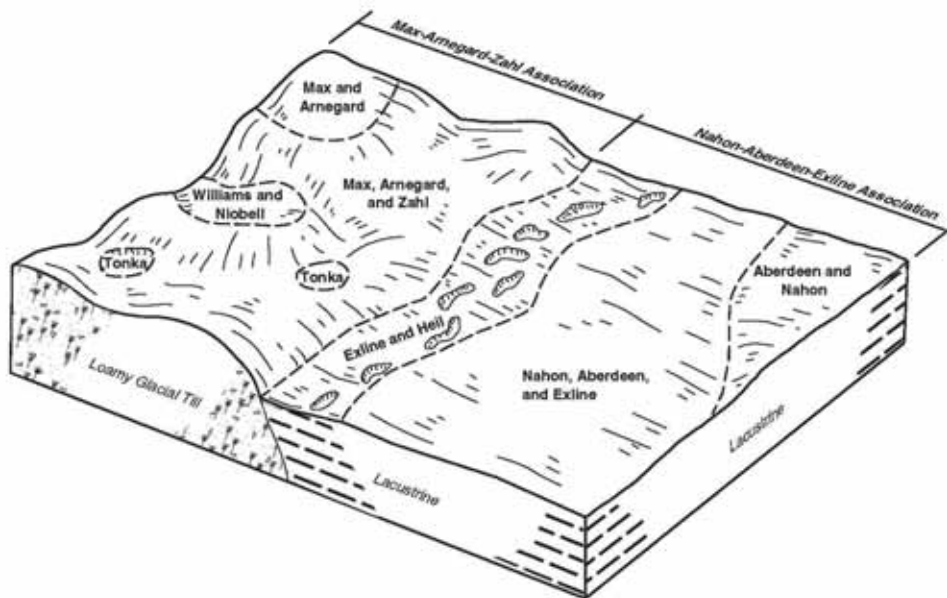


Figure 3. Pattern of soils and underlying materials in the Nahon-Aberdeen-Exline and Max-Arnegard-Zahl associations.

Depth to restrictive feature: Nahon - natric-top depth ranges from 6 to 17 inches;

Aberdeen - none; Exline - natric-top depth ranges from 0 to 6 inches

Depth to contrasting parent material: Nahon - greater than 60 inches;

Aberdeen - greater than 60 inches; Exline - greater than 60 inches

Depth to water table: Nahon - 3.5 to 5 feet; Aberdeen - 3.5 to 5 feet; Exline - 1.5 to 3.5 feet

Flooding: Nahon - none; Aberdeen - none; Exline - none

Ponding: Nahon - none; Aberdeen - none; Exline - none

Permeability: Nahon - very slow; Aberdeen - slow; Exline - very slow

Available water capacity: Nahon - moderate; Aberdeen - high; Exline - moderate

Organic matter content: Nahon - moderate; Aberdeen - moderate;

Exline - moderately low

Surface runoff: Nahon - low; Aberdeen - low; Exline - low

Minor Soils

Well drained Beotia and Great Bend soils which have more silt and less clay in the subsoil on summits, backslopes, and footslopes

Moderately well drained Harmony soils which do not have a sodium-affected subsoil on summits and backslopes

Poorly drained Harriet soils on low flood plains

Poorly drained Heil soils in basins

Poorly drained, clayey Ludden soils on low flood plains

Somewhat poorly drained Ranslo soils on high flood plains

Use and Management

Major use: About 70 percent is cropland

Other use: About 30 percent is pasture and hayland

Main crops: Nahon and Aberdeen - spring wheat, barley, alfalfa, and sunflowers;

Exline - unsuited

Management concerns: Sodium-affected subsoils adversely affects crop growth by restricting root penetration, slow (Aberdeen) and very slow (Nahon and Exline) permeability. Minor soils can have significant management concerns. Review the detailed descriptions to determine if the minor soils will limit or affect the intended use of this soil association.

6. Ludden-Lamoure Association

Poorly drained and somewhat poorly drained, level and nearly level, clayey and silty soils on flood plains (fig. 2)

Percent of survey area: 1 percent

Composition

Ludden and similar soils: 55 percent

Lamoure and similar soils: 25 percent

Minor soils: 20 percent

Setting

Landform position: Ludden - low flood plains; Lamoure - low flood plains

Slope range: Ludden - 0 to 1 percent; Lamoure - 0 to 2 percent

Soil Properties and Qualities

Texture of the surface layer: Ludden - silty clay; Lamoure - silty clay loam

Drainage class: Ludden - poorly drained; Lamoure - somewhat poorly drained

Depth to Restrictive Feature: Ludden - none; Lamoure - none

Depth to contrasting parent material: Ludden - greater than 60 inches;
Lamoure - greater than 60 inches

Depth to water table: Ludden - plus 0.5 to 1.5 feet; Lamoure - 0 to 2 feet

Flooding: Ludden - frequent for long periods; Lamoure - frequent for brief to long periods

Ponding: Ludden - none; Lamoure - none

Permeability: Ludden - low; Lamoure - moderately slow

Available water capacity: Ludden - high; Lamoure - high

Organic matter content: Ludden - high; Lamoure - high

Surface runoff: Ludden - very low; Lamoure - low

Minor Soils

Well drained Beotia, Great Bend, and Zell soils on footslopes, backslopes, and shoulders on lake plains

Moderately well drained LaDelle soils on high flood plains

Poorly drained, saline Playmoor soils on low flood plains

Somewhat poorly drained Ranslo soils which have a sodium-affected subsoil on high flood plains

Use and Management

Major land use: About 60 percent is cropland

Other land use: About 40 percent is pasture and hayland

Main crops: Corn, soybeans, spring wheat, and sunflowers

Management concerns: Ludden - flooding, high water table, wind erosion, high content of lime adversely affect the availability of plant nutrient, surface compaction, slow permeability; Lamoure - flooding, high water table, wind erosion, high content of lime adversely affects the availability of plant nutrients. Minor soils can have significant management concerns. Review the detailed

descriptions to determine if the minor soils will limit or affect the intended use of this soil association.

LEVEL TO MODERATELY SLOPING, LOAMY AND SILTY SOILS ON MOIST, COOL** TILL PLAINS AND FLOOD PLAINS (MLRA-55B)****

These soils formed in silty material over loamy glacial till, loamy glacial till, and alluvium. They are on level to moderately sloping slopes. These soils make up about 21 percent of the county. Most areas are used for cultivated crops. The clayey soils in the Cresbard-Cavour-Ferney Association are used mostly for pastureland, hayland, or rangeland. Conserving moisture, controlling water erosion on slopes greater than 2 percent, sodium-affected subsoils, and slow and very slow permeability are the main management concerns. Flooding, high water table, wind erosion, compaction, slow water intake rate, and salinity are the main management concerns on the Lowe, Ludden, and Playmoor soils and sodium-affected subsoils on the Ranslo and Harriet soils that are on flood plains.

7. Kranzburg-Cresbard-Brookings Association

Well drained and moderately well drained, nearly level to gently sloping, silty soils and moderately well drained, nearly level, sodium-affected, silty soils on till plains

Percent of survey area: 3 percent

Composition

Kranzburg and similar soils: 40 percent

Cresbard and similar soils: 20 percent

Brookings and similar soils: 15 percent

Minor soils: 25 percent

Setting

Landform position: Kranzburg - summits and backslopes; Cresbard - footslopes; Brookings - footslopes

Slope range: Kranzburg - 0 to 6 percent; Cresbard - 0 to 2 percent; Brookings - 0 to 2 percent

Soil Properties and Qualities

Texture of the surface layer: Kranzburg - silt loam; Cresbard - silt loam; Brookings - silt loam

Drainage class: Kranzburg - well drained; Cresbard - moderately well drained; Brookings - moderately well drained

Depth to restrictive feature: Kranzburg - none; Cresbard - none; Brookings - none

Depth to contrasting parent material: Kranzburg - 20 to 40 inches over glacial till; Cresbard - greater than 60 inches; Brookings - 20 to 40 inches over glacial till

Depth to water table: Kranzburg - 4 to 6 feet; Cresbard - 3.5 to 5 feet; Brookings - 3 to 5 feet

Flooding: Kranzburg - none; Cresbard - none; Brookings - none

Ponding: Kranzburg - none; Cresbard - none; Brookings - none

Permeability: Kranzburg - moderately slow; Cresbard - slow; Brookings - moderately slow

Available water capacity: Kranzburg - high; Cresbard - high; Brookings - high

Organic matter content: Kranzburg - moderate; Cresbard - moderate; Brookings - high

Surface runoff: Kranzburg - low or medium; Cresbard - low; Brookings - low

Minor Soils

Well drained Buse soils which are calcareous to the surface on shoulders
 Moderately well drained Cavour soils which have a sodium-affected subsoil that has a greater amount of exchangeable sodium than the Cresbard soils on lower footslopes
 Moderately well drained and somewhat poorly drained Ferney soils which have a sodium-affected subsoil and salts less than 16 inches from the surface on footslopes
 Poorly drained Harriet soils which have a sodium-affected subsoil on low flood plains
 Poorly drained Heil and Tonka soils in basins
 Somewhat poorly drained Ranslo soils on high flood plains

Use and Management

Major use: About 90 percent is cropland
Other use: About 10 percent is pasture and hayland
Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers
Management concerns: Kranzburg - water erosion on slopes greater than 2 percent; Cresbard - sodium-affected subsoil adversely affects crop growth by restricting root penetration, slow permeability; Brookings - few limitations except to conserve moisture. Minor soils can have significant management concerns. Review the detailed descriptions to determine if the minor soils will limit or affect the intended use of this soil association.

8. Forman-Aastad Association

Well drained and moderately well drained, nearly level to moderately sloping, loamy soils on till plains

Percent of survey area: 3 percent

Composition

Forman and similar soils: 40 percent
 Aastad and similar soils: 25 percent
 Minor soils: 35 percent

Setting

Landform position: Forman - summits and backslopes; Aastad - footslopes

Slope range: Forman - 0 to 9 percent; Aastad - 0 to 6 percent

Soil Properties and Qualities

Texture of the surface layer: Forman - loam; Aastad - loam
Drainage class: Forman - well drained; Aastad - moderately well drained
Depth to restrictive feature: Forman - none; Aastad - none
Depth to contrasting parent material: Forman - greater than 60 inches; Aastad - greater than 60 inches
Depth to water table: Forman - greater than 6 feet; Aastad - 2.5 to 4 feet
Flooding: Forman - none; Aastad - none
Ponding: Forman - none; Aastad - none
Permeability: Forman - moderately slow; Aastad - moderately slow
Available water capacity: Forman - high; Aastad - high
Organic matter content: Forman - moderate; Aastad - high
Surface runoff: Forman - low or medium; Aastad - low or medium

Minor Soils

Well drained Buse soils which are calcareous to the surface on shoulders
 Moderately well drained Cresbard and Cavour soils which have a sodium-affected subsoil (Cresbard soils have less exchangeable sodium in the subsoil than the Cavour soils) on footslopes
 Somewhat poorly drained Hamerly soils which are calcareous at or near the surface on footslopes
 Poorly drained Heil and Tonka soils in basins
 Moderately well drained LaDelle soils on high flood plains
 Somewhat poorly drained Moritz and Ranslo soils (Ranslo soils having a sodium-affected subsoil) on high flood plains

Use and Management

Major use: About 85 percent is cropland
Other use: About 15 percent is pasture and hayland
Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers
Management concerns: Forman and Aastad - water erosion on slopes greater than 2 percent. Minor soils can have significant management concerns. Review the detailed descriptions to determine if the minor soils will limit or affect the intended use of this soil association.

9. Forman-Cresbard-Cavour Association

Well drained, nearly level to moderately sloping, loamy soils and moderately well drained, nearly level to gently sloping, sodium-affected, loamy soils; on till plains (fig. 4)

Percent of survey area: 7 percent

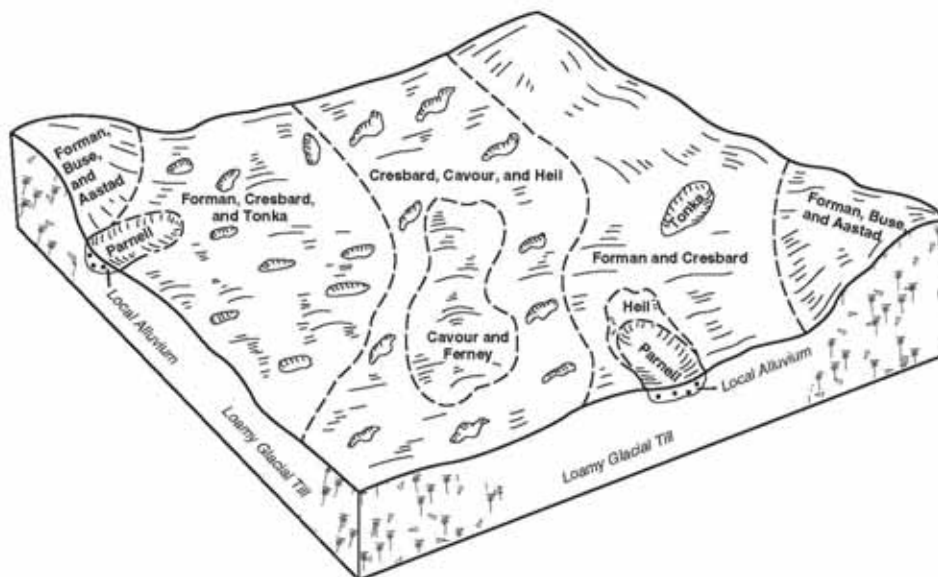


Figure 4. Pattern of soils and underlying materials in the Forman-Cresbard-Cavour association.

Composition

Forman and similar soils: 40 percent
 Cresbard and similar soils: 20 percent
 Cavour and similar soils: 10 percent
 Minor soils: 30 percent

Setting

Landform position: Forman - summits and backslopes; Cresbard - footslopes;
 Cavour - footslopes
Slope range: Forman - 0 to 9 percent; Cresbard - 0 to 6 percent; Cavour - 0 to 2 percent

Soil Properties and Qualities

Texture of the surface layer: Forman - loam; Cresbard - loam; Cavour - loam
Drainage class: Forman - well drained; Cresbard - moderately well drained;
 Cavour - moderately well drained
Depth to restrictive feature: Forman - none; Cresbard - none; Cavour - natric-top
 depth ranges from 4 to 18 inches
Depth to contrasting parent material: Forman - greater than 60 inches;
 Cresbard - greater than 60 inches; Cavour - greater than 60 inches
Depth to water table: Forman - greater than 6 feet; Cresbard - 3.5 to 5 feet;
 Cavour - 3.5 to 5 feet
Flooding: Forman - none; Cresbard - none; Cavour - none
Ponding: Forman - none; Cresbard - none; Cavour - none
Permeability: Forman - moderately slow; Cresbard - slow; Cavour - very slow
Available water capacity: Forman - high; Cresbard - high; Cavour - moderate
Organic matter content: Forman - moderate; Cresbard - moderate;
 Cavour - moderate
Surface runoff: Forman - low or medium; Cresbard - low or medium; Cavour - low

Minor Soils

Moderately well drained Aastad soils which are dark to a depth greater than the
 Forman soils on footslopes
 Well drained Buse soils which are calcareous to the surface on shoulders
 Poorly drained Heil and Tonka soils in basins
 Moderately well drained La Prairie soils on high flood plains
 Somewhat poorly drained Ranslo soils on high flood plains

Use and Management

Major use: About 70 percent is cropland
Other use: About 30 percent is pasture and hayland
Main crops: Spring wheat, alfalfa, sunflowers, corn, and soybeans
Management concerns: Forman - water erosion on slopes greater than 2 percent;
 Cresbard - water erosion on slopes greater than 2 percent, sodium-affected
 subsoil adversely affects crop growth by restricting root penetration, slow
 permeability; Cavour - sodium-affected subsoil adversely affects crop growth by
 restricting root penetration, very slow permeability. Minor soils can have
 significant management concerns. Review the detailed descriptions to determine
 if the minor soils will limit or affect the intended use of this soil association.

10. Cresbard-Cavour-Ferney Association

Moderately well drained and somewhat poorly drained, nearly level, sodium-affected, loamy soils on till plains

Percent of survey area: 5 percent

Composition

Cresbard and similar soils: 25 percent

Cavour and similar soils: 25 percent

Ferney and similar soils: 15 percent

Minor soils: 35 percent

Setting

Landform position: Cresbard - summits and backslopes; Cavour - footslopes; Ferney - footslopes

Slope range: Cresbard - 0 to 6 percent; Cavour - 0 to 2 percent; Ferney - 0 to 2 percent

Soil Properties and Qualities

Texture of the surface layer: Cresbard - loam; Cavour - loam; Ferney - loam

Drainage class: Cresbard - moderately well drained; Cavour - moderately well drained; Ferney - moderately well drained and somewhat poorly drained

Depth to restrictive feature: Cresbard - none; Cavour - natric-top depth ranges from 4 to 18 inches; Ferney - natric-top depth ranges from 0 to 6 inches

Depth to contrasting parent material: Cresbard - greater than 60 inches; Cavour - greater than 60 inches; Ferney - greater than 60 inches

Depth to water table: Cresbard - 3.5 to 5 feet; Cavour - 3.5 to 5 feet; Ferney - 3.5 to 5 feet

Flooding: Cresbard - none; Cavour - none; Ferney - none

Ponding: Cresbard - none; Cavour - none; Ferney - none

Permeability: Cresbard - slow; Cavour - very slow; Ferney - very slow

Available water capacity: Cresbard - high; Cavour - moderate; Ferney - moderate

Organic matter content: Cresbard - moderate; Cavour - moderate; Ferney - moderately low

Surface runoff: Cresbard - low or medium; Cavour - low; Ferney - low

Minor Soils

Well drained Forman soils which do not have a sodium-affected subsoil on backslopes

Poorly drained Harriet soils on low flood plains

Poorly drained Heil soils in basins

Somewhat poorly drained Ranslo soils on high flood plains

Use and Management

Major use: About 60 percent is pasture and hayland

Other use: About 40 percent is cropland

Main crops: Cresbard and Cavour - spring wheat, barley, alfalfa, and sunflowers; Ferney - unsuited

Management concerns: Cresbard - water erosion on slopes greater than 2 percent, sodium-affected subsoil adversely affects crop growth by restricting root penetration, slow permeability; Cavour and Ferney - sodium-affected subsoil adversely affects crop growth by restricting root penetration, very slow permeability. Minor soils can have significant management concerns. Review the

detailed descriptions to determine if the minor soils will limit or affect the intended use of this soil association.

11. Ranslo-Harriet Association

Somewhat poorly drained and poorly drained, level and nearly level, loamy soils on flood plains

Percent of survey area: 2 percent

Composition

Ranslo and similar soils: 35 percent

Harriet and similar soils: 35 percent

Minor soils: 30 percent

Setting

Landform position: Ranslo - high flood plains; Harriet - low flood plains

Slope range: Ranslo - 0 to 2 percent; Harriet - 0 to 1 percent

Soil Properties and Qualities

Texture of the surface layer: Ranslo - loam; Harriet - loam

Drainage class: Ranslo - somewhat poorly drained; Harriet - poorly drained

Depth to restrictive feature: Ranslo - natric-top depth ranges from 2 to 16 inches;
Harriet - natric-top depth ranges from 0 to 5 inches

Depth to contrasting parent material: Ranslo - greater than 60 inches;
Harriet - greater than 60 inches

Depth to water table: Ranslo - 1 to 3 feet; Harriet - 0 to 1 feet

Flooding: Ranslo - occasional for brief periods; Harriet - occasional for long periods

Ponding: Ranslo - none; Harriet - none

Permeability: Ranslo - slow; Harriet - very slow

Available water capacity: Ranslo - high; Harriet - moderate

Organic matter content: Ranslo - high; Harriet - moderately low

Surface runoff: Ranslo - low; Harriet - very low

Minor Soils

Moderately well drained La Prairie soils on high flood plains

Somewhat poorly drained Lowe soils which do not have a sodium-affected subsoil and contain less clay on low flood plains

Poorly drained and very poorly drained Ludden soils which do not have a sodium-affected subsoil and are clayey to the surface on low flood plains

Poorly drained Playmoor soils

Use and Management

Major land use: About 60 percent is cropland

Other land use: About 40 percent is pasture and hayland

Main crops: Corn, soybeans, spring wheat, and sunflowers

Management concerns: Ranslo - flooding, high water table, a sodium-affected subsoil (which adversely affects plant growth by restricting the penetration of plant roots), slow permeability; Harriet - flooding, high water table, a sodium-affected subsoil (which adversely affects plant growth by restricting the penetration of plant roots), very slow permeability. Minor soils can have significant management concerns. Review the detailed descriptions to determine if the minor soils will limit or affect the intended use of this soil association.

12. La Prairie-Playmoor-Lowe Association

Moderately well drained and poorly drained, level and nearly level, silty and loamy soils on flood plains

Percent of survey area: Less than 1 percent

Composition

La Prairie and similar soils: 30 percent

Playmoor and similar soils: 25 percent

Lowe and similar soils: 20 percent

Minor soils: 25 percent

Setting

Landform position: La Prairie - high flood plains; Playmoor - low flood plains;
Lowe - low flood plains

Slope range: La Prairie - 0 to 2 percent; Playmoor - 0 to 1 percent; Lowe - 0 to 1 percent

Soil Properties and Qualities

Texture of the surface layer: La Prairie - loam; Playmoor - silty clay loam;
Lowe - loam

Drainage class: La Prairie - moderately well drained; Playmoor - poorly drained;
Lowe - poorly drained

Depth to restrictive feature: La Prairie - none; Playmoor - none; Lowe - none

Depth to contrasting parent material: La Prairie - greater than 60 inches;
Playmoor - greater than 60 inches; Lowe - greater than 60 inches

Depth to water table: La Prairie - 3.5 to 5 feet; Playmoor - 0 to 1.5; Lowe - 0 to 1.5 feet

Flooding: La Prairie - rare to occasional for brief periods; Playmoor - frequent for brief periods; Lowe - occasional for brief periods

Ponding: La Prairie - none; Playmoor - none; Lowe - none

Permeability: La Prairie - moderate; Playmoor - moderately slow; Lowe - moderate

Available water capacity: La Prairie - high; Playmoor - high; Lowe - high

Organic matter content: La Prairie - high; Playmoor - high; Lowe - high

Surface runoff: La Prairie - low; Playmoor - very low; Lowe - low

Minor Soils

Well drained Egeland soils which have less clay on summits and backslopes

Moderately well drained Embden soils which have less clay on backslopes

Well drained Fordville soils which have gravelly material within a depth of 20 to 40 inches on footslopes

Well drained Forman soils on summits and backslopes on till plains

Use and Management

Major land use: About 50 percent is cropland

Other land use: About 50 percent is pasture and hayland

Main crops: Corn, soybeans, spring wheat, and sunflowers

Management concerns: La Prairie - flooding; Playmoor - flooding, high water table, wind erosion, high content of lime which adversely affects the availability of plant nutrient, high salt content; Lowe - flooding, high water table, wind erosion, high content of lime which adversely affects the availability of plant nutrients. Minor soils can have significant management concerns. Review the detailed descriptions to determine if the minor soils will limit or affect the intended use of this soil association.

13. LaDelle-Ludden Association

Moderately well drained and poorly drained, level and nearly level, silty and clayey soils on flood plains

Percent of survey area: Less than 1 percent

Composition

LaDelle and similar soils: 50 percent

Ludden and similar soils: 20 percent

Minor soils: 30 percent

Setting

Landform position: LaDelle - high flood plains; Ludden - low flood plains

Slope range: LaDelle - 0 to 2 percent; Ludden - 0 to 1 percent

Soil Properties and Qualities

Texture of the surface layer: LaDelle - silty clay; Ludden - silty clay loam

Drainage class: LaDelle - moderately well drained; Ludden - poorly drained

Depth to restrictive feature: LaDelle - none; Ludden - none

Depth to contrasting parent material: LaDelle - greater than 60 inches;

Ludden - greater than 60 inches

Depth to water table: LaDelle - 0 to 2 feet; Ludden - 0 to 1 feet

Flooding: LaDelle - rare to frequent for brief periods; Ludden - frequent for long periods

Ponding: LaDelle - none; Ludden - none

Permeability: LaDelle - moderate; Ludden - slow

Available water capacity: LaDelle - high; Ludden - high

Organic matter content: LaDelle - high; Ludden - high

Surface runoff: LaDelle - low; Ludden - very low

Minor Soils

Moderately well drained Aberdeen soils which have a sodium-affected subsoil on summits and backslopes on lake plains

Well drained Great Bend soils on summits and backslopes on lake plains

Somewhat poorly drained Lamoure soils which do not have a sodium-affected subsoil on low flood plains

Somewhat poorly drained Ranslo soils which have a sodium-affected subsoil on high flood plains

Use and Management

Major land use: About 60 percent is cropland

Other land use: About 40 percent is pasture and hayland

Main crops: Corn, soybeans, spring wheat, and sunflowers

Management concerns: LaDelle - flooding; Ludden - flooding, high water table, wind erosion, high content of lime which adversely affect the availability of plant nutrient, compaction, slow permeability. Minor soils can have significant management concerns. Review the detailed descriptions to determine if the minor soils will limit or affect the intended use of this soil association.

LEVEL TO STEEP, LOAMY, SILTY, AND SANDY SOILS ON DRY,
WARM** TILL PLAINS, OUTWASH PLAINS, AND FLOOD PLAINS
(MLRA-55C) ****

These soils formed in loamy and clayey glacial till, sandy and loamy glaciofluvial sediments, loamy alluvium over glacial outwash, and clayey and loamy alluvium. They are on level to steep slopes. These soils make up about 26 percent of the county. About 70 to 80 percent are used for cultivated crops, except the Northville-Farmsworth-Durrstein association and Betts-Lamo association are about 60 percent pastureland, hayland, or rangeland. Conserving moisture, controlling water erosion on slopes greater than 2 percent, wind erosion, high lime content which adversely affects the availability of plant nutrients, sodium-affected subsoils, and slow and very slow permeability are the main management concerns. Agrochemical leaching is also a concern on the Carthage, Delmont, Enet, Forestburg, and Dimo soils. Flooding and high water table are also a concern on the flood plain Northville, Farmsworth, and Durrstein soils.

14. Houdek-Stickney-Dudley Association

Well drained, nearly level to moderately sloping, loamy soils and moderately well drained, nearly level, sodium-affected, silty soils on till plains

Percent of survey area: 2 percent

Composition

Houdek and similar soils: 45 percent
Stickney and similar soils: 30 percent
Dudley and similar soils: 10 percent
Minor soils: 15 percent

Setting

Landform position: Houdek - summits and backslopes; Stickney - footslopes;
Dudley - footslopes

Slope range: Houdek - 0 to 9 percent; Stickney - 0 to 2 percent; Dudley - 0 to 2 percent

Soil Properties and Qualities

Texture of the surface layer: Houdek - loam; Stickney - silt loam; Dudley - silt loam

Drainage class: Houdek - well drained; Stickney - moderately well drained;
Dudley - moderately well drained

Depth to restrictive feature: Houdek - none; Stickney - none; Dudley - natric-top
depth ranges from 7 to 17 inches

Depth to contrasting parent material: Houdek - greater than 60 inches;
Stickney - greater than 60 inches; Dudley - greater than 60 inches

Depth to water table: Houdek - greater than 6 feet; Stickney - 3.5 to 5 feet;
Dudley - 3.5 to 5 feet

Flooding: Houdek - none; Stickney - none; Dudley - none

Ponding: Houdek - none; Stickney - none; Dudley - none

Permeability: Houdek - moderately slow; Stickney - slow; Dudley - very slow

Available water capacity: Houdek - high; Stickney - high; Dudley - moderate

Organic matter content: Houdek - moderate; Stickney - moderate;
Dudley - moderate

Surface runoff: Houdek - low or medium; Stickney - low; Dudley - low

Minor Soils

Somewhat poorly drained Crossplain soils on toeslopes
 Well drained Ethan soils which are calcareous to the surface on shoulders
 Poorly drained Hoven and Tetonka soils in basins
 Moderately well drained Jerauld soils which have visible salts within a depth of 16 inches on lower footslopes
 Moderately well drained Prosper soils which lack a sodium-affected subsoil on footslopes

Use and Management

Major use: About 70 percent is cropland
Other use: About 30 percent is pasture and hayland
Main crops: Spring wheat, alfalfa, sunflowers, corn, and soybeans
Management concerns: Houdek - water erosion on slopes greater than 2 percent; Stickney and Dudley - sodium-affected subsoil adversely affects crop growth by restricting root penetration, slow (Stickney) and very slow (Dudley) permeability. Minor soils can have significant management concerns. Review the detailed descriptions to determine if the minor soils will limit or affect the intended use of this soil association.

15. Beadle-Stickney-Dudley Association

Well drained, nearly level to gently sloping, loamy soils and moderately well drained, nearly level, sodium-affected, silty soils on till plains

Percent of survey area: 6 percent

Composition

Beadle and similar soils: 50 percent
 Stickney and similar soils: 25 percent
 Dudley and similar soils: 15 percent
 Minor soils: 10 percent

Setting

Landform position: Beadle - summits and backslopes; Stickney - footslopes; Dudley - footslopes

Slope range: Beadle - 0 to 6 percent; Stickney - 0 to 2 percent; Dudley - 0 to 2 percent

Soil Properties and Qualities

Texture of the surface layer: Beadle - loam; Stickney - silt loam; Dudley - silt loam

Drainage class: Beadle - well drained; Stickney - moderately well drained; Dudley - moderately well drained

Depth to restrictive feature: Beadle - none; Stickney - none; Dudley - natric-top depth ranges from 7 to 17 inches

Depth to contrasting parent material: Beadle - greater than 60 inches; Stickney - greater than 60 inches; Dudley - greater than 60 inches

Depth to water table: Beadle - greater than 6 feet; Stickney - 3.5 to 5 feet; Dudley - 3.5 to 5 feet

Flooding: Beadle - none; Stickney - none; Dudley - none

Ponding: Beadle - none; Stickney - none; Dudley - none

Permeability: Beadle - slow; Stickney - slow; Dudley - very slow

Available water capacity: Beadle - high; Stickney - high; Dudley - moderate

Organic matter content: Beadle - moderate; Stickney - moderate;
Dudley - moderate

Surface runoff: Beadle - low or medium; Stickney - low; Dudley - low

Minor Soils

Well drained Ethan soils which are calcareous to the surface on shoulders

Poorly drained Hoven soils in basins

Moderately well drained Jerauld soils which have visible salts within a depth of 16 inches on lower footslopes

Use and Management

Major use: About 70 percent is cropland

Other use: About 30 percent is pasture and hayland

Main crops: Spring wheat, alfalfa, sunflowers, corn, and soybeans

Management concerns: Beadle - water erosion on slopes greater than 2 percent, slow permeability; Stickney and Dudley - sodium-affected subsoil adversely affects crop growth by restricting root penetration, slow (Stickney) and very slow (Dudley) permeability. Minor soils can have significant management concerns. Review the detailed descriptions to determine if the minor soils will limit or affect the intended use of this soil association.

16. Stickney-Dudley-Hoven Association

Moderately well drained and poorly drained, level and nearly level, sodium-affected, silty soils on till plains

Percent of survey area: 1 percent

Composition

Stickney and similar soils: 35 percent

Dudley and similar soils: 30 percent

Hoven and similar soils: 15 percent

Minor soils: 20 percent

Setting

Landform position: Stickney - summits and backslopes; Dudley - footslopes;
Hoven - basins

Slope range: Stickney - 0 to 2 percent; Dudley - 0 to 2 percent; Hoven - 0 to 1 percent

Soil Properties and Qualities

Texture of the surface layer: Stickney - silt loam; Dudley - silt loam; Hoven - silt loam

Drainage class: Stickney - moderately well drained; Dudley - moderately well drained; Hoven - poorly drained

Depth to restrictive feature: Stickney - none; Dudley - natric-top depth ranges from 7 to 17 inches; Hoven - natric-top depth ranges from 1 to 6 inches

Depth to contrasting parent material: Stickney - greater than 60 inches;
Dudley - greater than 60 inches; Hoven - greater than 60 inches

Depth to water table: Stickney - 3.5 to 5 feet; Dudley - 3.5 to 5 feet; Hoven - plus 1 to 1.5 feet

Flooding: Stickney - none; Dudley - none; Hoven - none

Ponding: Stickney - none; Dudley - none; Hoven - frequent for long periods

Permeability: Stickney - slow; Dudley - very slow; Hoven - very slow

Available water capacity: Stickney - high; Dudley - moderate; Hoven - moderate

Organic matter content: Stickney - moderate; Dudley - moderate;
Hoven - moderate

Surface runoff: Stickney - low; Dudley - low; Hoven - negligible

Minor Soils

Well drained Beadle soils which lack a sodium-affected subsoil on summits and backslopes

Well drained Houdek soils which lack a sodium-affected subsoil and have less clay on summits and backslopes

Moderately well drained Jerauld soils which have visible salts within a depth of 16 inches on lower footslopes

Poorly drained Tetonka soils which lack a sodium-affected subsoil and are in basins

Use and Management

Major use: About 70 percent is cropland

Other use: About 30 percent is pasture and hayland

Main crops: Spring wheat, alfalfa, sunflowers, corn, and soybeans

Management concerns: Stickney - water erosion on slopes greater than 2 percent, slow permeability; Dudley - sodium-affected subsoil adversely affects crop growth by restricting root penetration, very slow permeability; Hoven - sodium-affected subsoil adversely affects crop growth by restricting root penetration, very slow permeability, and ponding. Minor soils can have significant management concerns. Review the detailed descriptions to determine if the minor soils will limit or affect the intended use of this soil association.

17. Hand-Ethan-Bonilla Association

Well drained and moderately well drained, nearly level to moderately steep and hilly, loamy soils on till plains (fig. 5)

Percent of survey area: 7 percent

Composition

Hand and similar soils: 35 percent

Ethan and similar soils: 20 percent

Bonilla and similar soils: 15 percent

Minor soils: 30 percent

Setting

Landform position: Hand - summits and backslopes; Ethan - shoulders;
Bonilla - footslopes

Slope range: Hand - 0 to 9 percent; Ethan - 2 to 20 percent; Bonilla - 0 to 6 percent

Soil Properties and Qualities

Texture of the surface layer: Hand - loam; Ethan - loam; Bonilla - loam

Drainage class: Hand - well drained; Ethan - well drained; Bonilla - moderately well drained

Depth to restrictive feature: Hand - none; Ethan - none; Bonilla - none

Depth to contrasting parent material: Hand - greater than 60 inches;
Ethan - greater than 60 inches; Bonilla - greater than 60 inches

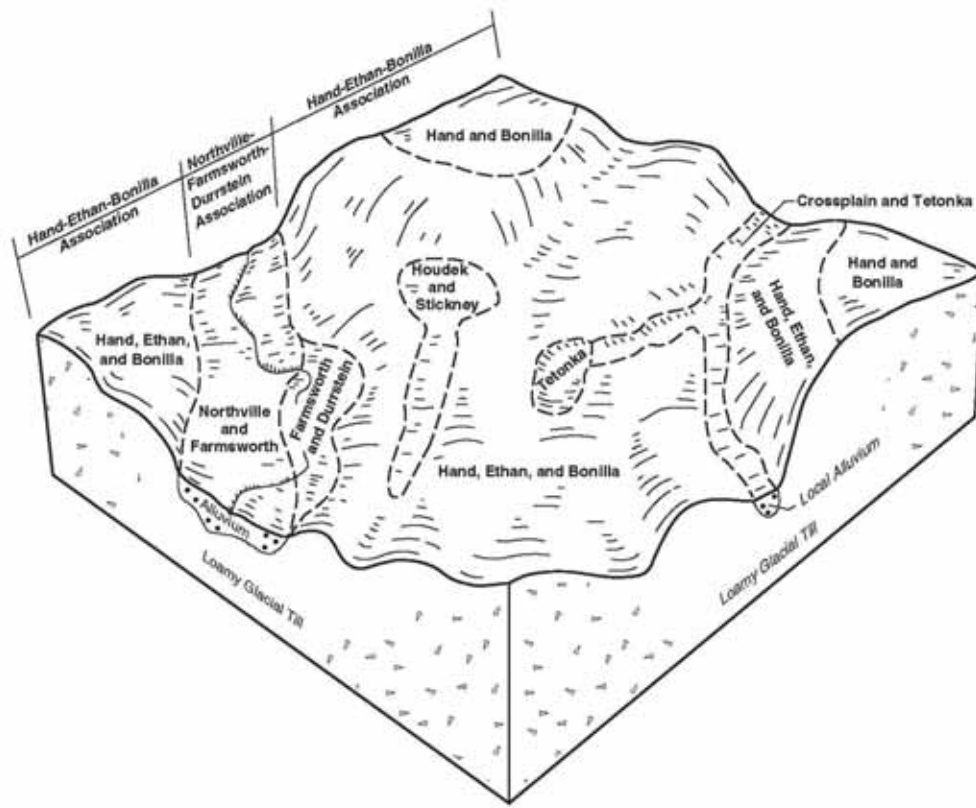


Figure 5. Pattern of soils and underlying materials in the Hand-Ethan-Bonilla and Northville-Farmsworth-Durrstein associations.

Depth to water table: Hand - greater than 6 feet; Ethan - greater than 6 feet;
Bonilla - 3.5 to 5 feet

Flooding: Hand - none; Ethan - none; Bonilla - none

Ponding: Hand - none; Ethan - none; Bonilla - none

Permeability: Hand - moderate; Ethan - moderately slow; Bonilla - moderately slow

Available water capacity: Hand - high; Ethan - high; Bonilla - high

Organic matter content: Hand - moderate; Ethan - moderately low; Bonilla - high

Surface runoff: Hand - low or medium; Ethan - medium or high; Bonilla - low or medium

Minor Soils

Moderately well drained Bon soils on high flood plains

Somewhat poorly drained Crossplain soils on toeslopes

Somewhat poorly drained Davison soils which are calcareous at or near the surface on footslopes

Somewhat excessively drained Delmont soils which have gravelly material within a depth of 14 to 20 inches on backslopes

Well drained Houdek soils which contain more clay in the subsoil on summits and backslopes

Poorly drained Lawet soils on toeslopes and poorly drained Tetonka soils in basins

Moderately well drained Stickney soils which have a sodium-affected subsoil on footslopes

Excessively drained Talmo soils which have gravelly material within a depth of 14 inches on shoulders

Use and Management

Major use: About 75 percent is cropland

Other use: About 25 percent is pasture and hayland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Management concerns: Hand and Bonilla - water erosion on slopes greater than 2 percent; Ethan - water erosion, wind erosion, and the high content of lime adversely which affects the availability of plant nutrients. Minor soils can have significant management concerns. Review the detailed descriptions to determine if the minor soils will limit or affect the intended use of this soil association.

18. Betts-Lamo Association

Well drained, moderately steep and steep, loamy soils on moraines and somewhat poorly drained, level, silty soils on flood plains

Percent of survey area: 1 percent

Composition

Betts and similar soils: 35 percent

Lamo and similar soils: 30 percent

Minor soils: 35 percent

Setting

Landform position: Betts - shoulders and backslopes; Lamo - low flood plains

Slope range: Betts - 15 to 40 percent; Lamo - 0 to 1 percent

Soil Properties and Qualities

Texture of the surface layer: Betts - loam; Lamo - silty clay loam

Drainage class: Betts - well drained; Lamo - somewhat poorly drained

Depth to restrictive feature: Betts - none; Lamo - none

Depth to contrasting parent material: Betts - greater than 60 inches;
Lamo - greater than 60 inches

Depth to water table: Betts - greater than 6 feet; Lamo - 1 to 3 feet

Flooding: Betts - none; Lamo - occasional for brief periods

Ponding: Betts - none; Lamo - none

Permeability: Betts - moderately slow; Lamo - moderately slow

Available water capacity: Betts - high; Lamo - high

Organic matter content: Bett - slow; Lamo - moderate

Surface runoff: Betts - very high; Lamo - low

Minor Soils

Moderately well drained Carthage soils on footslopes

Well drained Hand soils on summits and backslopes

Moderately well drained LaDelle soils on high flood plains

Use and Management

Major land use: About 60 percent is pasture and hayland

Other land use: About 40 percent is cropland

Main crops: Betts - unsuited; Lamo - corn, soybeans, sunflowers, and spring wheat

Management concerns: Betts - wind erosion, water erosion, and the high content of lime which adversely affects the availability of plant nutrients; Lamo - flooding, high water table, wind erosion, and the high content of lime which adversely affects the availability of plant nutrients. Minor soils can have significant

management concerns. Review the detailed descriptions to determine if the minor soils will limit or affect the intended use of this soil association.

19. Hand-Carthage-Forestburg Association

Well drained and moderately well drained, nearly level to gently sloping, loamy and sandy soils on till plains (fig. 6)

Percent of survey area: 4 percent

Composition

Hand and similar soils: 30 percent

Carthage and similar soils: 20 percent

Forestburg and similar soils: 15 percent

Minor soils: 35 percent

Setting

Landform position: Hand - summits and backslopes; Carthage - footslopes;
Forestburg - footslopes

Slope range: Hand - 0 to 6 percent; Carthage - 0 to 2 percent; Forestburg - 0 to 2 percent

Soil Properties and Qualities

Texture of the surface layer: Hand - fine sandy loam; Carthage - fine sandy loam;
Forestburg - loamy sand

Drainage class: Hand - well drained; Carthage - moderately well drained;
Forestburg - moderately well drained

Depth to restrictive feature: Hand - none; Carthage - none; Forestburg - none

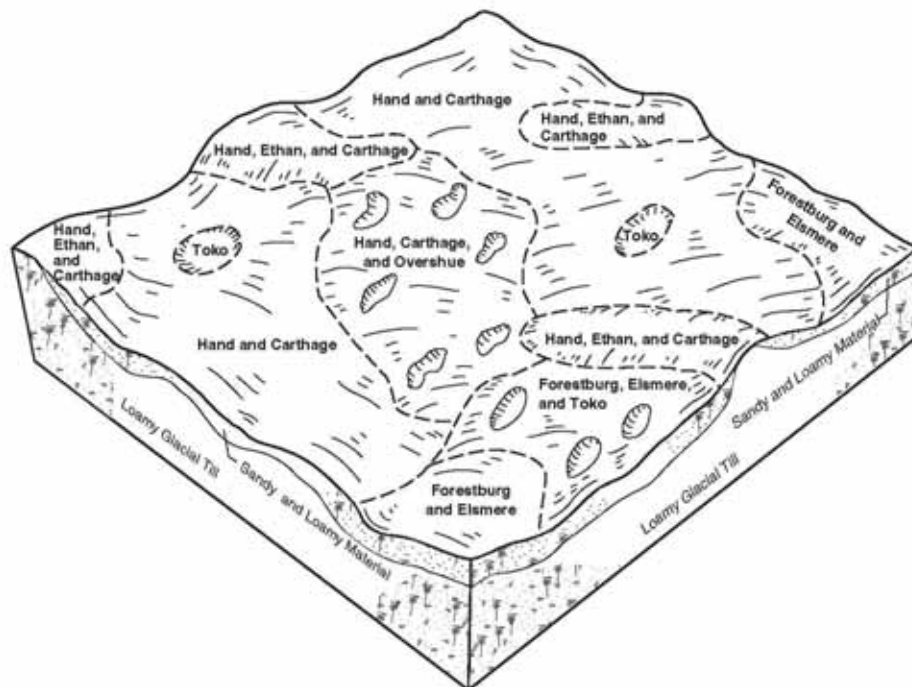


Figure 6. Pattern of soils and underlying materials in the Hand-Carthage-Forestburg association.

Depth to contrasting parent material: Hand - greater than 60 inches;

Carthage - 20 to 40 inches over glacial till; Forestburg - 20 to 40 inches over glacial till

Depth to water table: Hand - greater than 6 feet; Carthage - 3 to 4 feet;

Forestburg - 2.5 to 4 feet

Flooding: Hand - none; Carthage - none; Forestburg - none

Ponding: Hand - none; Carthage - none; Forestburg - none

Permeability: Hand - moderate; Carthage - moderately rapid in the loamy sediments and moderately slow in the underlying glacial till; Forestburg - rapid in the sandy sediments and moderately slow in the underlying glacial till

Available water capacity: Hand - high; Carthage - moderate; Forestburg - moderate

Organic matter content: Hand - moderate; Carthage - moderate;

Forestburg - moderately low

Surface runoff: Hand - low or medium; Carthage - low; Forestburg - very low

Minor Soils

Moderately well drained Bon soils on high flood plains

Moderately well drained Bonilla soils on footslopes

Somewhat poorly drained Els and Elsmere (thicker dark colored) soils on toeslopes

Well drained Ethan soils which are calcareous to the surface on shoulders

Moderately well drained Ipage soils which have fine sand in the upper part on summits and backslopes

Poorly drained Lawet soils which are calcareous to the surface on toeslopes

Poorly drained Overshue (shallow basins) and Toko (deeper basins) soils in basins

Excessively drained Talmo soils which have gravelly material within a depth of 14 inches on shoulders

Use and Management

Major use: About 80 percent is cropland

Other use: About 20 percent is pasture and hayland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Management concerns: Hand - water erosion on slopes greater than 2 percent, wind erosion; Carthage - wind erosion, moderate available water capacity; Forestburg - wind erosion, moderate available water capacity, agrochemical leaching. Minor soils can have significant management concerns. Review the detailed descriptions to determine if the minor soils will limit or affect the intended use of this soil association.

20. Dimo-Grat Association

Moderately well drained, somewhat poorly drained, and poorly drained, nearly level and level, loamy soils on outwash plains

Percent of survey area: Less than 1 percent

Composition

Dimo and similar soils: 55 percent

Grat and similar soils: 15 percent

Minor soils: 30 percent

Setting

Landform position: Dimo - footslopes; Grat - basins

Slope range: Dimo - 0 to 2 percent; Grat - 0 to 1 percent

Soil Properties and Qualities

Texture of the surface layer: Dimo - loam; Grat - loam

Drainage class: Dimo - moderately well drained and somewhat poorly drained;
Grat - poorly drained

Depth to restrictive feature: Strongly contrasting textural stratification; top depth ranges from 20 to 40 inches

Depth to contrasting layer: Dimo - 20 to 40 inches over gravelly material;
Grat - 20 to 40 inches over gravelly material

Depth to water table: Dimo - 1.5 to 3 feet; Grat - plus 1 to 2 feet

Flooding: Dimo - rare for brief periods; Grat - none

Ponding: Dimo - none; Grat - occasional for long periods

Permeability: Dimo - moderate in the loamy sediments and rapid in the underlying gravelly material; Grat - slow in the solum and rapid in the underlying gravelly material

Available water capacity: Dimo - moderate; Grat - moderate

Organic matter content: Dimo - high; Grat - high

Surface runoff: Dimo - low; Grat - negligible

Minor Soils

Moderately well drained Davis soils which are not underlain with gravelly material on high flood plains

Poorly drained Durrstein soils which have a sodium-affected subsoil on low flood plains

Somewhat poorly drained Farmsworth soils which have a sodium-affected subsoil and are not underlain with gravelly material on micro-lows on flood plains

Well drained Houdek soils on summits and backslopes on till plains

Moderately well drained Northville soils which are not underlain with gravelly material and have a sodium-affected subsoil on micro-highs on flood plains

Use and Management

Major land use: About 80 percent is cropland

Other land use: About 20 percent is pasture and hayland

Main crops: Corn, soybeans, spring wheat, and sunflowers

Management concerns: Dimo - flooding, high water table, moderate available water capacity, agrochemical leaching; Grat - ponding, high water table, agrochemical leaching. Minor soils can have significant management concerns. Review the detailed descriptions to determine if the minor soils will limit or affect the intended use of this soil association.

21. Northville-Farmsworth-Durrstein Association

Moderately well drained, somewhat poorly drained and poorly drained, level and nearly level, sodium-affected, silty soils on flood plains (fig. 5)

Percent of survey area: 2 percent

Composition

Northville and similar soils: 30 percent

Farmsworth and similar soils: 20 percent

Durrstein and similar soils: 10 percent

Minor soils: 40 percent

Setting

Landform position: Northville - high flood plains; Farmsworth - low flood plains;
Durrstein - low flood plains

Slope range: Northville - 0 to 2 percent; Farmsworth - 0 to 2 percent; Durrstein - 0 to 1 percent

Soil Properties and Qualities

Texture of the surface layer: Northville - silt loam; Farmsworth - silt loam;
Durrstein - silt loam

Drainage class: Northville - moderately well drained; Farmsworth - somewhat poorly drained; Durrstein - poorly drained

Depth to restrictive feature: Northville - none; Farmsworth - natric-top depth ranges from 5 to 12 inches; Durrstein - natric-top depth ranges from 1 to 4 inches

Depth to contrasting parent material: Northville - greater than 60 inches;
Farmsworth - greater than 60 inches; Durrstein - greater than 60 inches

Depth to water table: Northville - 4 to 6 feet; Farmsworth - 1.5 to 3 feet;
Durrstein - 0 to 1.5 feet

Flooding: Northville - rare; Farmsworth - rare; Durrstein - occasional for brief periods

Ponding: Northville - none; Farmsworth - none; Durrstein - none

Permeability: Northville - slow; Farmsworth - very slow; Durrstein - very slow

Available water capacity: Northville - moderate; Farmsworth - moderate;
Durrstein - moderate

Organic matter content: Northville - moderate; Farmsworth - moderate;
Durrstein - moderately low

Surface runoff: Northville - low; Farmsworth - low; Durrstein - very low

Minor Soils

Moderately well drained Bon and Davis (calcareous below 20") soils which do not have a sodium-affected subsoil on high flood plains

Somewhat excessively drained Delmont soils which have gravelly material within a depth of 14 to 20 inches on summits and backslopes on outwash plains

Moderately well drained and somewhat poorly drained Dimo soils which have gravelly material within a depth of 40 inches on footslopes

Moderately well drained Forestburg soils which have sandy material over glacial till on summits and backslopes on till plains

Well drained Hand soils which do not have a sodium-affected subsoil on backslopes

Poorly drained Hoven soils in basins

Poorly drained and very poorly drained Lawet soils which do not have a sodium-affected subsoil on low flood plains

Moderately well drained Whitelake and Woonsocket (contains < Exch. Na. Whitelake) soils which have more sand and less clay in the surface layer and subsoil on footslopes

Use and Management

Major use: About 60 percent is cropland

Other use: About 40 percent is pasture and hayland

Main crops: Northville and Farmsworth - spring wheat, barley, alfalfa, and sunflowers; Durrstein - unsuited

Management concerns: Northville and Farmsworth - sodium-affected subsoil which adversely affects crop growth by restricting root penetration, slow (Northville) and very slow (Farmsworth) permeability; Durrstein - flooding, high water table, sodium-affected subsoil which adversely affects crop growth by restricting root

penetration, very slow permeability. Minor soils can have significant management concerns. Review the detailed descriptions to determine if the minor soils will limit or affect the intended use of this soil association.

22. Delmont-Enet Association

Somewhat excessively drained and well drained, nearly level, loamy soils on outwash plains

Percent of survey area: Less than 1 percent

Composition

Delmont and similar soils: 40 percent

Enet and similar soils: 25 percent

Minor soils: 35 percent

Setting

Landform position: Delmont - summits and backslopes; Enet - footslopes

Slope range: Delmont - 0 to 2 percent; Enet - 0 to 2 percent

Soil Properties and Qualities

Texture of the surface layer: Delmont - loam; Enet - loam

Drainage class: Delmont - somewhat excessively drained; Enet - well drained

Depth to restrictive feature: Delmont - strongly contrasting textural stratification-top depth ranges from 14 to 20 inches; Enet - strongly contrasting textural stratification-top depth ranges from 20 to 40 inches

Depth to contrasting parent material: Delmont - 14 to 20 inches to gravelly material; Enet - 20 to 40 inches to gravelly material

Depth to water table: Delmont - greater than 6 feet; Enet - greater than 6 feet

Flooding: Delmont - none; Enet - none

Ponding: Delmont - none; Enet - none

Permeability: Delmont - moderate in the loamy sediments and rapid in the underlying gravelly material; Enet - moderate in the loamy sediments and very rapid in the underlying gravelly material

Available water capacity: Delmont - low; Enet - moderate

Organic matter content: Delmont - moderate; Enet - moderate

Surface runoff: Delmont - low; Enet - low

Minor Soils

Moderately well drained Blendon soils which do not have gravelly material within a depth of 40 inches

Moderately well drained and somewhat poorly drained Dima soils on footslopes

Somewhat poorly drained Farmsworth soils which have a sodium-affected subsoil on micro-lows on flood plains

Well drained Hand soils which are not underlain with gravelly material on summits and backslopes

Excessively drained Talmo soils which have gravelly material within a depth of 14 inches on shoulders

Use and Management

Major land use: About 90 percent is cropland

Other land use: About 10 percent is pasture and hayland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Management concerns: Delmont - low available water capacity, agrochemical leaching; Enet - moderate available water capacity, agrochemical leaching.

Minor soils can have significant management concerns. Review the detailed descriptions to determine if the minor soils will limit or affect the intended use of this soil association.

NEARLY LEVEL TO STRONGLY SLOPING, LOAMY AND SILTY SOILS ON DRY, COOL** TILL PLAINS AND FLOOD PLAINS (MLRA-53B)****

These soils formed in loamy glacial till. They are on nearly level to moderately steep slopes. These soils make up about 8 percent of the county. About 70 to 80 percent are used for cultivated crops and the remaining for pastureland, hayland, or rangeland. Conserving moisture, controlling water erosion on slopes greater than 2 percent, wind erosion, high content of lime which adversely affects the availability of plant nutrients, sodium-affected subsoils, and slow permeability are the main management concerns.

23. Williams-Bowbells Association

Well drained and moderately well drained, nearly level to moderately sloping and gently rolling, loamy soils on till plains

Percent of survey area: 1 percent

Composition

Williams and similar soils: 50 percent

Bowbells and similar soils: 20 percent

Minor soils: 30 percent

Setting

Landform position: Williams - summits and backslopes; Bowbells - footslopes

Slope range: Williams - 0 to 9 percent; Bowbells - 0 to 6 percent

Soil Properties and Qualities

Texture of the surface layer: Williams - loam; Bowbells - loam

Drainage class: Williams - well drained; Bowbells - moderately well drained

Depth to restrictive feature: Williams - none; Bowbells - none

Depth to contrasting parent material: Williams - greater than 60 inches;

Bowbells - greater than 60 inches

Depth to water table: Williams - greater than 6 feet; Bowbells - 3.5 to 5 feet

Flooding: Williams - none; Bowbells - none

Ponding: Williams - none; Bowbells - none

Permeability: Williams - moderately slow; Bowbells - moderately slow

Available water capacity: Williams - high; Bowbells - high

Organic matter content: Williams - moderate; Bowbells - high

Surface runoff: Williams - low or medium; Bowbells - low or medium

Minor Soils

Poorly drained Harriet soils which have a sodium-affected subsoil on low flood plains

Moderately well drained LaDelle soils on high flood plains

Moderately well drained Niobell soils which have a sodium-affected subsoil on footslopes

Very poorly drained Parnell soils in basins

Poorly drained Tonka soils in basins

Well drained Zahl soils which are calcareous to the surface on shoulders

Use and Management

Major land use: About 80 percent is cropland

Other land use: About 20 percent is pasture and hayland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Management concerns: Water erosion on slopes greater than 2 percent. Minor soils can have significant management concerns. Review the detailed descriptions to determine if the minor soils will limit or affect the intended use of this soil association.

24. Williams-Niobell-Noonan Association

Well drained, nearly level to moderately sloping, loamy soils and moderately well drained, nearly level to gently sloping, sodium-affected, loamy soils on till plains

Percent of survey area: 3 percent

Composition

Williams and similar soils: 40 percent

Niobell and similar soils: 20 percent

Noonan and similar soils: 10 percent

Minor soils: 30 percent

Setting

Landform position: Williams - summits and backslopes; Niobell - footslopes; Noonan - footslopes

Slope range: Williams - 0 to 9 percent; Niobell - 0 to 6 percent; Noonan - 0 to 3 percent

Soil Properties and Qualities

Texture of the surface layer: Williams - loam; Niobell - loam; Noonan - loam

Drainage class: Williams - well drained; Niobell - moderately well drained; Noonan - moderately well drained

Depth to restrictive feature: Williams - none; Niobell - none; Noonan - natric-top depth ranges from 5 to 10 inches

Depth to contrasting parent material: Williams - greater than 60 inches; Niobell - greater than 60 inches; Noonan - greater than 60 inches

Depth to water table: Williams - greater than 6 feet; Niobell - 3.5 to 5 feet; Noonan - 3.5 to 5 feet

Flooding: Williams - none; Niobell - none; Noonan - none

Ponding: Williams - none; Niobell - none; Noonan - none

Permeability: Williams - moderately slow; Niobell - slow; Noonan - very slow

Available water capacity: Williams - high; Niobell - high; Noonan - moderate

Organic matter content: Williams - moderate; Niobell - moderate; Noonan - moderate

Surface runoff: Williams - low or medium; Niobell - low or medium; Noonan - low

Minor Soils

Moderately well drained Arnegard soils which are dark to a greater depth than the Williams soils on footslopes

Poorly drained Harriet which have visible salts within a depth of 16 inches on low flood plains

Moderately well drained Miranda soils which have visible salts within a depth of 16 inches on lower footslopes

Poorly drained Heil and Tonka soils in basins

Moderately well drained La Prairie soils on high flood plains
 Somewhat poorly drained Ranslo soils on high flood plains
 Well drained Zahl soils which are calcareous to the surface on shoulders

Use and Management

Major use: About 70 percent is cropland

Other use: About 30 percent is pasture and hayland

Main crops: Spring wheat, alfalfa, sunflowers, corn, and soybeans

Management concerns: Williams - water erosion on slopes greater than 2 percent;
 Niobell - water erosion on slopes greater than 2 percent, sodium-affected subsoil adversely affects crop growth by restricting root penetration, slow permeability;
 Noonan - sodium-affected subsoil adversely affects crop growth by restricting root penetration, very slow permeability. Minor soils can have significant management concerns. Review the detailed descriptions to determine if the minor soils will limit or affect the intended use of this soil association.

25. Max-Arnegard-Zahl Association

Well drained and moderately well drained, nearly level to moderately steep and hilly, loamy soils on till plains (fig. 3)

Percent of survey area: 4 percent

Composition

Max and similar soils: 50 percent

Arnegard and similar soils: 25 percent

Zahl and similar soils: 10 percent

Minor soils: 15 percent

Setting

Landform position: Max - summits and backslopes; Arnegard - footslopes;
 Zahl - shoulders

Slope range: Max - 0 to 15 percent; Arnegard - 0 to 6 percent; Zahl - 13 to 20 percent

Soil Properties and Qualities

Texture of the surface layer: Max - loam; Arnegard - loam; Zahl - loam

Drainage class: Max - well drained; Arnegard - moderately well drained; Zahl - well drained

Depth to restrictive feature: Max - none; Arnegard - none; Zahl - none

Depth to contrasting parent material: Max - greater than 60 inches;

Arnegard - greater than 60 inches; Zahl - greater than 60 inches

Depth to water table: Max - greater than 6 feet; Arnegard - 3 to 5 feet; Zahl - greater than 6 feet

Flooding: Max - none; Arnegard - none; Zahl - none

Ponding: Max - none; Arnegard - none; Zahl - none

Permeability: Max - moderately slow; Arnegard - moderate; Zahl - moderately slow

Available water capacity: Max - high; Arnegard - high; Zahl - high

Organic matter content: Max - moderate; Arnegard - high; Zahl - moderately low

Surface runoff: Max - low, medium, or high; Arnegard - low or medium;
 Zahl - medium or high

Minor Soils

Moderately well drained Niobell soils which have a sodium-affected subsoil on footslopes

Poorly drained Tonka soils in basins

Use and Management

Major use: About 70 percent is cropland

Other use: About 30 percent is pasture and hayland

Main crops: Max and Arnegard soils - Corn, soybeans, spring wheat, alfalfa, and sunflowers; Zahl soils - unsuited

Management concerns: Max and Arnegard - water erosion on slopes greater than 2 percent; Zahl - water erosion, wind erosion, high content of lime which adversely affects the availability of plant nutrients. Minor soils can have significant management concerns. Review the detailed descriptions to determine if the minor soils will limit or affect the intended use of this soil association.

26. Dovecreek-Straw Association

Moderately well drained and well drained, nearly level, silty and loamy soils on flood plains

Percent of survey area: 1 percent

Composition

Dovecreek and similar soils: 50 percent

Straw and similar soils: 30 percent

Minor soils: 20 percent

Setting

Landform position: Dovecreek - low flood plains; Straw - low flood plains

Slope range: Dovecreek - 0 to 2 percent; Straw - 0 to 2 percent

Soil Properties and Qualities

Texture of the surface layer: Dovecreek - silt loam; Straw - loam

Drainage class: Dovecreek - moderately well drained; Straw - well drained

Depth to restrictive feature: Dovecreek - none; Straw - none

Depth to contrasting parent material: Dovecreek - greater than 60 inches; Straw - greater than 60 inches

Depth to water table: Dovecreek - 3.5 to 5 feet; Straw - 3.5 to 5 feet

Flooding: Dovecreek - rare; Straw - rare to frequent for brief periods

Ponding: Dovecreek - none; Straw - none

Permeability: Dovecreek - moderate; Straw - moderate

Available water capacity: Dovecreek - high; Straw - high

Organic matter content: Dovecreek - high; Straw - high

Surface runoff: Dovecreek - low; Straw - low

Minor Soils

Moderately well drained Bowdle soils which have gravelly material within a depth of 20 to 40 inches on footslopes on outwash plains

Poorly drained Harriet soils which have a sodium-affected subsoil on low flood plains

Somewhat poorly drained Lamoure soils which are clayey throughout on low flood plains

Somewhat excessively drained Lehr soils which have gravelly material within a depth of 14 to 20 inches on summits and backslopes on outwash plains
Somewhat poorly drained Ranslo soils which have a sodium-affected subsoil on high flood plains

Use and Management

Major land use: About 60 percent is cropland

Other land use: About 40 percent is pasture and hayland

Main crops: Corn, soybeans, spring wheat, and sunflowers

Management concerns: Dovecreek - few limitations except to conserve moisture; Straw - flooding. Minor soils can have significant management concerns. Review the detailed descriptions to determine if the minor soils will limit or affect the intended use of this soil association.

** See "Formation of Soils (Climate)"

Detailed Soil Map Units

The map units delineated on the detailed maps represent the soils in the county. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses. More information about each map unit is given under the heading "Use and Management of the Soils."

A map unit delineation on a map represents an area dominated by one or more major kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils for which it is named and some included areas that belong to other taxonomic classes.

Most included soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, inclusions. They may or may not be mentioned in the map unit description. Other included soils, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, inclusions. They generally are in small areas up to 4 acres and could not be mapped separately because of the scale used. The included areas of contrasting soils are mentioned in the map unit descriptions. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps. A few included areas may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils on the landscape.

The presence of included areas in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans, but if intensive use of small areas is planned, onsite investigation is needed to define and locate the soils.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a soil series. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into soil phases. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Beotia silt loam, 0 to 2 percent slopes is a phase of the Beotia series.

Some map units are made up of two or more major soils. These map units are called complexes. A complex consists of two or more soils in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils are somewhat similar in all areas. Great Bend-Beotia silt loams, 0 to 2 percent slopes is an example.

The series in the map units are on different landform positions. These different landform positions affect such things as the amount of topsoil, drainage classes, runoff, productivity, and organic matter content.

The soils are assigned to various interpretive groups at the end of each map unit description and in some of the tables. The interpretive groups for each map unit are also shown in the "Interpretive Groups" table. For more information on interpretive groups, see "Use and Management of the Soils."

The "Acreage and Proportionate Extent of the Soils" table gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The "Glossary" defines many of the terms used in describing the soils.

Aa—Aastad loam, 0 to 2 percent slopes

Composition

Aastad and similar soils: 80 to 90 percent
Contrasting inclusions: 10 to 20 percent

Setting

Landform: Till plains
Landform position: Footslopes
Slope range: 0 to 2 percent
Shape of areas: Long and narrow
Size of areas: 5 to 100 acres

Typical Profile

Surface layer:

0 to 14 inches - dark gray loam

Subsoil:

14 to 21 inches - grayish brown clay loam
21 to 29 inches - light olive brown clay loam with redox concentrations
29 to 43 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions
43 to 57 inches - grayish brown calcareous clay loam with redox concentrations and depletions

Underlying layer:

57 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Moderately well drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: 3 to 5 feet

Flooding: None

Ponding: None

Permeability: Moderately slow

Available water capacity: High

Organic matter content: High

Surface runoff: Low

Other properties: Runoff water flows over the Aastad soil during periods of rainfall or snowmelt.

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Fordville soils which have gravelly material at a depth of 20 to 40 inches on footslopes

Well drained Forman soils which are dark to a depth of less than 16 inches on backslopes

Poorly drained Tonka soils in basins

Similar inclusions:

Soils that are dark to a depth greater than 24 inches

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Well suited

Management concerns:

Few limitations except to conserve moisture

Management measures:

Managing tillage and leaving crop residue conserves moisture and helps to maintain organic matter content and tilth.

Interpretive Groups

Land capability classification: IIc

Ecological site: Loamy Overflow

Conservation tree and shrub group: 1

Forage suitability group: Overflow

Ab—Aastad-Hamerly loams, 0 to 2 percent slopes

Composition

Aastad and similar soils: 40 to 55 percent

Hamerly and similar soils: 20 to 40 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Till plains

Landform position: Aastad - footslopes; Hamerly - lower footslopes

Slope range: Aastad - 0 to 2 percent; Hamerly - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Aastad

Surface layer:

0 to 14 inches - dark gray loam

Subsoil:

14 to 21 inches - grayish brown clay loam

21 to 29 inches - light olive brown clay loam with redox concentrations

29 to 43 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

43 to 57 inches - grayish brown, calcareous clay loam with redox concentrations and depletions

Underlying layer

57 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Hamerly

Surface layer:

0 to 9 inches - dark gray, calcareous loam

Subsoil:

9 to 14 inches - light gray, calcareous loam

14 to 29 inches - light brownish gray, calcareous loam with redox concentrations

Underlying layer:

29 to 68 inches - light olive gray, calcareous clay loam with redox concentrations and depletions

68 to 80 inches - light gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Aastad - moderately well drained; Hamerly - somewhat poorly drained

Depth to restrictive feature: Aastad - none; Hamerly - none

Depth to contrasting parent material: Aastad - greater than 60 inches; Hamerly - greater than 60 inches

Depth to high water table: Aastad - 3 to 5 feet; Hamerly - 1.5 to 3.5 feet

Flooding: Aastad - none; Hamerly - none

Ponding: Aastad - none; Hamerly - none

Permeability: Aastad - moderately slow; Hamerly - moderately slow

Available water capacity: Aastad - high; Hamerly - high

Organic matter content: Aastad - high; Hamerly - moderate

Surface runoff: Aastad - low; Hamerly - low

Other properties: Uptake of nutrients is adversely affected by a high content of lime in the Hamerly soil.

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Cresbard soils which have a sodium-affected subsoil on footslopes

Well drained Forman soils which are not calcareous at or near the surface and are dark to a depth less than 16 inches on backslopes
Poorly drained Tonka soils in basins

Use and Management

Cropland

Main crops: Spring wheat, corn, sunflowers, alfalfa, and soybeans

Suitability for cropland: Well suited

Management concerns:

Aastad - few limitations except to conserve moisture; Hamerly - wind erosion, high content of lime adversely affects the availability of plant nutrients

Management measures:

Minimizing tillage and leaving crop residue on the surface help to conserve moisture and control erosion.

Rotations including grasses and legumes help to control erosion and maintain fertility, organic matter content, and tilth.

Interpretive Groups

Land capability classification: Aastad - IIc; Hamerly - IIe

Ecological site: Aastad - Loamy Overflow; Hamerly - Limy Subirrigated

Conservation tree and shrub group: Aastad - 1; Hamerly - 2KK

Forage suitability group: Aastad - Overflow; Hamerly - Subirrigated

Ad—Aastad-Tonka complex, 0 to 2 percent slopes

Composition

Aastad and similar soils: 55 to 65 percent

Tonka and similar soils: 25 to 35 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Aastad - footslopes; Tonka - basins

Slope range: Aastad - 0 to 2 percent; Tonka - 0 to 1 percent

Shape of areas: Long and narrow

Size of areas: 5 to 50 acres

Typical Profile

Aastad

Surface layer:

0 to 14 inches - dark gray loam

Subsoil:

14 to 21 inches - grayish brown clay loam

21 to 29 inches - light olive brown, clay loam with redox concentrations

29 to 43 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

43 to 57 inches - grayish brown, calcareous clay loam with redox concentrations and depletions

Underlying layer

57 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Tonka

Surface layer:

0 to 8 inches - dark gray silt loam

Subsurface layer:

8 to 16 inches - light gray, silt loam with redox concentrations

Subsoil:

16 to 35 inches - dark gray silty clay

35 to 41 inches - gray silty clay

Underlying layer:

41 to 68 inches - light gray, calcareous clay loam with redox concentrations and depletions

68 to 80 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Aastad - moderately well drained; Tonka - poorly drained

Depth to restrictive feature: Aastad - none; Tonka - none

Depth to contrasting parent material: Aastad - greater than 60 inches;
Tonka - greater than 60 inches

Depth to high water table: Aastad - 3 to 5 feet; Tonka - plus 1 to 1.5 feet

Flooding: Aastad - none; Tonka - none

Ponding: Aastad - none; Tonka - frequent for long periods

Permeability: Aastad - moderately slow; Tonka - slow

Available water capacity: Aastad - high; Tonka - high

Organic matter content: Aastad - high; Tonka - high

Surface runoff: Aastad - low; Tonka - negligible

Other properties: Runoff water flows over the Aastad soil during periods of rainfall or snowmelt.

Inclusions

Contrasting inclusions: (May have significant management concerns)

Somewhat poorly drained Hamerly soils which are calcareous at or near the surface on footslopes

Similar inclusions:

Soils that have more clay in the subsoil than the Aastad soil

Use and Management

Cropland

Main crops: Aastad - corn, soybeans, spring wheat, alfalfa, and sunflowers;

Tonka - corn, soybeans, spring wheat, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Aastad - few limitations except to conserve moisture; Tonka - ponding, high water table

Management measures:

Minimizing tillage and leaving crop residue on the surface help to conserve moisture.

The Tonka soil is better suited to late planted crops. Deferring tillage when the Tonka soil is wet helps to limit compaction. Maintain existing drainage systems to remove excess water.

Interpretive Groups

Land capability classification: Aastad - IIc; Tonka - IVw

Ecological site: Aastad - Loamy Overflow; Tonka - Wet Meadow

Conservation tree and shrub group: Aastad - 1; Tonka - 10

Forage suitability group: Aastad - Overflow; Tonka - Wet

Ae—Aberdeen-Nahon silt loams, till substratum, 0 to 2 percent slopes

Composition

Aberdeen and similar soils: 50 to 60 percent

Nahon and similar soils: 30 to 40 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Aberdeen - summits and backslopes; Nahon - footslopes

Slope range: Aberdeen - 0 to 2 percent; Nahon - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 20 to 200 acres

Typical Profile

Aberdeen

Surface layer:

0 to 6 inches - dark gray silt loam

Transitional layer:

6 to 11 inches - gray silty clay loam

Subsoil:

11 to 17 inches - dark gray silty clay

17 to 23 inches - grayish brown silty clay

23 to 36 inches - light gray, calcareous silty clay loam

Underlying layer

36 to 49 inches - pale yellow, calcareous, varved silty clay loam

49 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Nahon

Surface layer:

0 to 7 inches - dark gray silt loam

Subsurface layer:

7 to 9 inches - gray silt loam

Subsoil:

9 to 15 inches - dark gray silty clay

15 to 21 inches - grayish brown silty clay

21 to 32 inches - light gray, calcareous silty clay loam with masses of salt and crystals of gypsum

32 to 43 inches - pale yellow, calcareous silty clay loam

Underlying layer:

43 to 49 inches - light yellowish brown, calcareous, varved silt loam with redox depletions

49 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Aberdeen - moderately well drained; Nahon - moderately well drained

Depth to restrictive feature: Aberdeen - none; Nahon - natric-top depth ranges from 6 to 17 inches

Depth to contrasting parent material: Aberdeen - greater than 40 inches over glacial till; Nahon - greater than 40 inches over glacial till

Depth to high water table: Aberdeen - 3.5 to 5 feet; Nahon - 3.5 to 5 feet

Flooding: Aberdeen - none; Nahon - none

Ponding: Aberdeen - none; Nahon - none

Permeability: Aberdeen - slow; Nahon - very slow

Available water capacity: Aberdeen - high; Nahon - moderate

Organic matter content: Aberdeen - moderate; Nahon - moderate

Surface runoff: Aberdeen - low; Nahon - low

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Well drained Beotia soils which do not have a sodium-affected subsoil on backslopes

Somewhat poorly drained Exline soils which have visible salts within a depth of 16 inches on footslopes

Moderately well drained Harmony soils which do not have a sodium-affected subsoil on backslopes

Poorly drained Heil soils in basins

Similar inclusions:

Soils that are less than 40 inches to loamy glacial till

Soils that are greater than 60 inches to loamy glacial till

Use and Management**Cropland**

Main crops: Spring wheat, barley, alfalfa, sunflowers, corn, and soybeans

Suitability for cropland: Poorly suited

Management concerns:

Aberdeen - slow permeability; Nahon - sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.

Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Aberdeen - IIIs; Nahon - IVs

Ecological site: Aberdeen - Clayey; Nahon - Claypan

Conservation tree and shrub group: Aberdeen - 4; Nahon - 9C

Forage suitability group: Aberdeen - Clayey Subsoil; Nahon - Claypan

Ah—Aberdeen-Nahon silty clay loams, 0 to 2 percent slopes

Composition

Aberdeen and similar soils: 50 to 60 percent

Nahon and similar soils: 30 to 40 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Aberdeen - summits and backslopes; Nahon - footslopes

Slope range: Aberdeen - 0 to 2 percent; Nahon - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 20 to 200 acres

Typical Profile

Aberdeen

Surface layer:

0 to 8 inches - dark gray silty clay loam

Transitional layer:

8 to 13 inches - gray silty clay loam

Subsoil:

13 to 23 inches - dark gray silty clay

23 to 31 inches - grayish brown, calcareous silty clay loam with masses of salt and crystals of gypsum

31 to 39 inches - light brownish gray, calcareous silty clay loam with masses of salt and crystals of gypsum

Underlying layer

39 to 80 inches - pale yellow, calcareous, varved silty clay loam with redox concentrations and depletions

Nahon

Surface layer:

0 to 7 inches - dark gray silty clay loam

Subsurface layer:

7 to 9 inches - gray silt loam

Subsoil:

9 to 24 inches - dark grayish brown silty clay

24 to 36 inches - light yellowish brown, calcareous silty clay loam with masses of salt and crystals of gypsum

Underlying layer:

36 to 46 inches - light gray calcareous, varved silty clay loam

46 to 80 inches - pale yellow calcareous, varved silty clay loam

Soil Properties and Qualities

Drainage class: Aberdeen - moderately well drained; Nahon - moderately well drained

Depth to restrictive feature: Aberdeen - none; Nahon - natric-top depth ranges from 6 to 17 inches

Depth to contrasting parent material: Aberdeen - greater than 60 inches; Nahon - greater than 60 inches

Depth to high water table: Aberdeen - 3.5 to 5 feet; Nahon - 3.5 to 5 feet

Flooding: Aberdeen - none; Nahon - none

Ponding: Aberdeen - none; Nahon - none

Permeability: Aberdeen - slow; Nahon - very slow

Available water capacity: Aberdeen - high; Nahon - moderate

Organic matter content: Aberdeen - moderate; Nahon - moderate

Surface runoff: Aberdeen - low; Nahon - low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Beotia soils which do not have a sodium-affected subsoil on backslopes

Somewhat poorly drained Exline soils which have visible salts within a depth of 16 inches on footslopes

Moderately well drained Harmony soils which do not have a sodium-affected subsoil on backslopes

Poorly drained Heil soils in basins

Use and Management

Cropland

Main crops: Spring wheat, barley, alfalfa, sunflowers, corn, and soybeans

Suitability for cropland: Poorly suited

Management concerns:

Aberdeen - slow permeability; Nahon - sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.

Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Aberdeen - IIIs; Nahon - IVs

Ecological site: Aberdeen - Clayey; Nahon - Claypan

Conservation tree and shrub group: Aberdeen - 4; Nahon - 9C

Forage suitability group: Aberdeen - Clayey Subsoil; Nahon - Claypan

An—Aberdeen-Nahon-Heil silt loams, 0 to 2 percent slopes

Composition

Aberdeen and similar soils: 40 to 50 percent

Nahon and similar soils: 25 to 40 percent

Heil and similar soils: 15 to 25 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Aberdeen - summits and backslopes; Nahon - footslopes; Heil - basins

Slope range: Aberdeen - 0 to 2 percent; Nahon - 0 to 2 percent; Heil - 0 to 1 percent

Shape of areas: Irregular

Size of areas: 20 to 100 acres

Typical Profile

Aberdeen

Surface layer:

0 to 8 inches - dark gray silt loam

Transitional layer:

8 to 13 inches - gray silty clay loam

Subsoil:

13 to 23 inches - dark gray silty clay

23 to 31 inches - grayish brown, calcareous silty clay loam with masses of salt and crystals of gypsum

31 to 39 inches - light brownish gray, calcareous silty clay loam with masses of salt and crystals of gypsum

Underlying layer

39 to 80 inches - pale yellow, calcareous, varved silty clay loam with redox concentrations and depletions

Nahon

Surface layer:

0 to 7 inches - dark gray silt loam

Subsurface layer:

7 to 9 inches - gray silt loam

Subsoil:

9 to 24 inches - dark grayish brown silty clay

24 to 36 inches - light yellowish brown, calcareous silty clay loam with masses of salt and crystals of gypsum

Underlying layer:

36 to 46 inches - light gray, calcareous, varved silty clay loam with redox depletions

46 to 80 inches - pale yellow, with redox depletions, calcareous, varved silty clay loam

Heil

Surface layer:

0 to 2 inches - gray, with redox concentrations, silt loam

Subsoil:

2 to 24 inches - dark gray silty clay with masses of salt and crystals of gypsum in the lower part

24 to 39 inches - gray, calcareous silty clay loam with masses of salt and crystals of gypsum

39 to 47 inches - light brownish gray, calcareous silty clay loam with masses of salt, crystals of gypsum, and redox concentrations and depletions

Underlying layer:

47 to 80 inches - pale olive, calcareous silty clay loam, with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Aberdeen - moderately well drained; Nahon - moderately well drained; Heil - poorly drained

Depth to restrictive feature: Aberdeen - none; Nahon - natric-top depth ranges from 6 to 17 inches; Heil - natric-top depth ranges from 1 to 4 inches
Depth to contrasting parent material: Aberdeen - greater than 60 inches; Nahon - greater than 60 inches; Heil - greater than 40 inches over glacial till and lacustrine
Depth to high water table: Aberdeen - 3.5 to 5 feet; Nahon - 3.5 to 5 feet; Heil - plus 1 to 1.5 feet
Flooding: Aberdeen - none; Nahon - none; Heil - none
Ponding: Aberdeen - none; Nahon - none; Heil - frequent for long periods
Permeability: Aberdeen - slow; Nahon - very slow; Heil - very slow
Available water capacity: Aberdeen - high; Nahon - moderate; Heil - moderate
Organic matter content: Aberdeen - moderate; Nahon - moderate; Heil - moderate
Surface runoff: Aberdeen - low; Nahon - low; Heil - negligible

Inclusions

Contrasting inclusions:

Somewhat poorly drained Exline soils which have visible salts within a depth of 16 inches on lower footslopes
 Moderately well drained Harmony soils which do not have a sodium-affected subsoil on backslopes

Similar inclusions:

Soils that have a thicker surface layer than the Heil soil

Use and Management

Cropland

Main crops: Aberdeen and Nahon - spring wheat, barley, sunflowers, alfalfa, corn, and soybeans; Heil - unsuited
 Suitability for cropland: Poorly suited

Management concerns:

Aberdeen - slow permeability; Nahon - sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability; Heil - ponding, high water table, sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, and very slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.
 Chiseling or subsoiling when the soils are dry increases permeability.
 The best use of the Heil soil is to establish permanent pasture or hayland species.

Interpretive Groups

Land capability classification: Aberdeen - IIIs; Nahon - IVs; Heil - VIs
Ecological site: Aberdeen - Clayey; Nahon - Claypan; Heil - Closed Depression
Conservation tree and shrub group: Aberdeen - 4; Nahon - 9C; Heil - 10
Forage suitability group: Aberdeen - Clayey Subsoil; Nahon - Claypan; Heil - Not Suited

Ao—Aberdeen-Nahon-Heil silt loams, till substratum, 0 to 2 percent slopes

Composition

Aberdeen and similar soils: 40 to 50 percent

Nahon and similar soils: 25 to 40 percent

Heil and similar soils: 15 to 25 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Aberdeen - summits and backslopes; Nahon - footslopes;

Heil - basins

Slope range: Aberdeen - 0 to 2 percent; Nahon - 0 to 2 percent; Heil - 0 to 1 percent

Shape of areas: Irregular

Size of areas: 20 to 100 acres

Typical Profile

Aberdeen

Surface layer:

0 to 6 inches - dark gray silt loam

Transitional layer:

6 to 11 inches - gray silty clay loam

Subsoil:

11 to 17 inches - dark gray silty clay

17 to 23 inches - grayish brown silty clay

23 to 36 inches - light gray, calcareous silty clay loam

Underlying layer:

36 to 49 inches - pale yellow, calcareous, varved silty clay loam

49 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Nahon

Surface layer:

0 to 7 inches - dark gray silt loam

Subsurface layer:

7 to 9 inches - gray silt loam

Subsoil:

9 to 15 inches - dark gray silty clay

15 to 21 inches - grayish brown silty clay

21 to 32 inches - light gray, calcareous silty clay loam with masses of salt and crystals of gypsum

32 to 43 inches - pale yellow, calcareous silty clay loam

Underlying layer:

43 to 49 inches - light yellowish brown, calcareous, varved silt loam with redox depletions

49 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Heil**Surface layer:**

0 to 2 inches - gray silt loam with redox concentrations

Subsoil:

2 to 24 inches - dark gray silty clay with masses of salt and crystals of gypsum in the lower part

24 to 39 inches - gray, calcareous silty clay loam with masses of salt and crystals of gypsum

39 to 47 inches - light brownish gray, calcareous silty clay loam with masses of salt, crystals of gypsum, and

Underlying layer:

47 to 80 inches - pale olive, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Aberdeen - moderately well drained; Nahon - moderately well drained; Heil - poorly drained

Depth to restrictive feature: Aberdeen - none; Nahon - natric-top depth ranges from 6 to 17 inches; Heil - natric-top depth ranges from 1 to 4 inches

Depth to contrasting parent material: Aberdeen - greater than 40 inches over glacial till; Nahon - greater than 40 inches over glacial till; Heil - greater than 40 inches over glacial till

Depth to high water table: Aberdeen - 3.5 to 5 feet; Nahon - 3.5 to 5 feet; Heil - plus 1 to 1.5 feet

Flooding: Aberdeen - none; Nahon - none; Heil - none

Ponding: Aberdeen - none; Nahon - none; Heil - frequent for long periods

Permeability: Aberdeen - slow; Nahon - very slow; Heil - very slow

Available water capacity: Aberdeen - high; Nahon - moderate; Heil - moderate

Organic matter content: Aberdeen - moderate; Nahon - moderate; Heil - moderate

Surface runoff: Aberdeen - low; Nahon - low; Heil - negligible

Inclusions**Contrasting inclusions:**

Somewhat poorly drained Exline soils which have visible salts within a depth of 16 inches on lower footslopes

Moderately well drained Harmony soils which do not have a sodium-affected subsoil on backslopes

Similar inclusions:

Soils that have a thicker surface layer than the Heil soil

Soils that are less than 40 inches to loamy glacial till

Soils that are greater than 60 inches to loamy glacial till

Use and Management**Cropland**

Main crops: Aberdeen and Nahon - spring wheat, barley, alfalfa, sunflowers, corn, and soybeans; Heil - unsuited

Suitability for cropland: Poorly suited

Management concerns:

Aberdeen - slow permeability; Nahon - sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability; Heil - ponding, high water table, sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.

Chiseling or subsoiling when the soils are dry increases permeability.

The best use of the Heil soil is to establish permanent pasture or hayland species.

Interpretive Groups

Land capability classification: Aberdeen - IIIs; Nahon - IVs; Heil - VIs

Ecological site: Aberdeen - Clayey; Nahon - Claypan; Heil - Closed Depression

Conservation tree and shrub group: Aberdeen - 4; Nahon - 9C; Heil - 10

Forage suitability group: Aberdeen - Clayey Subsoil; Nahon - Claypan; Heil - Not Suited

At—Aquents, loamy, 0 to 2 percent slopes**Composition**

Aquents and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Excavation and spoil

Slope range: 0 to 2 percent

Shape of areas: Irregular

Size of areas: 5 to 100 acres

Soil Properties and Qualities

Drainage class: Very poorly drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: Plus 2 to 2 feet

Flooding: None

Ponding: Frequent for very long periods

Permeability: Slow

Available water capacity: Moderate

Organic matter content: Low

Surface runoff: Negligible

Inclusions

Contrasting inclusions: (May have significant management concerns)

Poorly drained Tonka soils in basins

Well drained Zell soils which are dark to a depth greater than 7 inches in undisturbed areas

Use and Management

Wildlife habitat:

Main crops: Unsited

Suitability for cropland: Unsited

Management concerns:

Most areas are used only as a source of fill material that was excavated down to the water table for construction purposes. Wetness and ponding are a concern. Some provide limited wildlife habitat.

Interpretive Groups

Land capability classification: Vw

Ecological site: Not assigned

Conservation tree and shrub group: 10

Forage suitability group: Not Suited

BaC—Beadle loam, 6 to 9 percent slopes**Composition**

Beadle and similar soils: 75 to 85 percent

Contrasting inclusions: 15 to 25 percent

Setting

Landform: Moraines

Landform position: Summits and backslopes

Slope range: 6 to 9 percent

Shape of areas: Irregular

Size of areas: 10 to 50 acres

Typical Profile**Surface layer:**

0 to 7 inches - dark gray loam

Subsoil:

7 to 16 inches - dark grayish brown clay loam

16 to 35 inches - light brownish gray, calcareous clay loam

Underlying layer:

35 to 80 inches - light brownish gray, calcareous clay loam with relict redox features

Soil Properties and Qualities

Drainage class: Well drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: Greater than 6 feet

Flooding: None

Ponding: None

Permeability: Slow

Available water capacity: High

Organic matter content: Moderate

Surface runoff: High

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Well drained Ethan soils which are calcareous to the surface on shoulders

Moderately well drained Stickney soils which have a sodium-affected subsoil on footslopes

Similar inclusions:

Soils that have less clay in the subsoil

Use and Management

Cropland

Main crops: Spring wheat, alfalfa, sunflowers, corn, and soybeans

Suitability for cropland: Poorly suited

Management concerns:

Water erosion, slow permeability

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control water erosion and conserve moisture.

Contour farming, terraces, and grassed waterways also help to control water erosion, but slopes in most areas are too short or too irregular for contouring and terracing.

Rotations including grasses and legumes help to control water erosion and maintain organic matter content and tilth.

Chiseling or subsoiling when the soils are dry helps to increase permeability.

Interpretive Groups

Land capability classification: IVe

Ecological site: Clayey

Conservation tree and shrub group: 4

Forage suitability group: Clayey Subsoil

BdA—Beadle-Dudley complex, 0 to 2 percent slopes

Composition

Beadle and similar soils: 45 to 60 percent

Dudley and similar soils: 25 to 40 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Till plains

Landform position: Beadle - summits and backslopes; Dudley - footslopes

Slope range: Beadle - 0 to 2 percent; Dudley - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Beadle

Surface layer:

0 to 7 inches - dark gray loam

Subsoil:

7 to 16 inches - dark grayish brown clay loam

16 to 35 inches - light brownish gray, calcareous clay loam

Underlying layer:

35 to 80 inches - light brownish gray, calcareous clay loam with relict redox features

Dudley

Surface layer:

0 to 5 inches - dark gray silt loam

Subsurface layer:

5 to 7 inches - gray silt loam

Subsoil:

7 to 18 inches - dark gray clay loam

18 to 25 inches - dark grayish brown, calcareous clay loam with masses of salt

25 to 39 inches - grayish brown, calcareous clay loam with masses of salt, nests of gypsum, and redox concentrations

Underlying layer:

39 to 62 inches - grayish brown, calcareous clay loam, with redox concentrations and depletions

62 to 80 inches - light gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Beadle - well drained; Dudley - moderately well drained

Depth to restrictive feature: Beadle - none; Dudley - natric-top depth ranges from 7 to 17 inches

Depth to contrasting parent material: Beadle - greater than 60 inches; Dudley - greater than 60 inches

Depth to high water table: Beadle - 4 to 6 feet; Dudley - 3.5 to 5 feet

Flooding: Beadle - none; Dudley - none

Ponding: Beadle - none; Dudley - none

Permeability: Beadle - slow; Dudley - very slow

Available water capacity: Beadle - high; Dudley - moderate

Organic matter content: Beadle - moderate; Dudley - moderate

Surface runoff: Beadle - low; Dudley - low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Poorly drained Hoven soils in basins

Moderately well drained Stickney soils which have less exchangeable sodium in the subsoil than the Dudley soil on footslopes

Similar inclusions:

Soils that have less clay in the subsoil than the Beadle soil

Use and Management

Cropland

Main crops: Spring wheat, barley, alfalfa, sunflowers, corn, and soybeans

Suitability for cropland: Fairly well suited

Management concerns:

Beadle - slow permeability; Dudley - sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.

Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Beadle - IIs; Dudley - IVs

Ecological site: Beadle - Clayey; Dudley - Claypan

Conservation tree and shrub group: Beadle - 4; Dudley - 9C

Forage suitability group: Beadle - Clayey Subsoil; Dudley - Claypan

BeA—Beadle-Stickney complex, 0 to 2 percent slopes**Composition**

Beadle and similar soils: 55 to 65 percent
Stickney and similar soils: 25 to 35 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Beadle - summits and backslopes; Stickney - footslopes

Slope range: Beadle - 0 to 2 percent; Stickney - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 500 acres

Typical Profile**Beadle****Surface layer:**

0 to 7 inches - dark gray loam

Subsoil:

7 to 16 inches - dark grayish brown clay loam

16 to 35 inches - light brownish gray, calcareous clay loam

Underlying layer:

35 to 80 inches - light brownish gray, calcareous clay loam with relict redox features

Stickney**Surface layer:**

0 to 7 inches - dark gray silt loam

Subsurface layer:

7 to 10 inches - gray silt loam

Transitional layer:

10 to 13 inches - dark grayish brown and gray silty clay loam

Subsoil:

13 to 22 inches - dark grayish brown clay loam

22 to 40 inches - light brownish gray, calcareous clay loam

Underlying layer:

40 to 80 inches - grayish brown, calcareous clay loam

Soil Properties and Qualities

Drainage class: Beadle - well drained; Stickney - moderately well drained

Depth to restrictive feature: Beadle - none; Stickney - none

Depth to contrasting parent material: Beadle - greater than 60 inches;
Stickney - greater than 60 inches

Depth to high water table: Beadle - 4 to 6 feet; Stickney - 3.5 to 5 feet

Flooding: Beadle - none; Stickney - none

Ponding: Beadle - none; Stickney - none

Permeability: Beadle - slow; Stickney - slow

Available water capacity: Beadle - high; Stickney - high

Organic matter content: Beadle - moderate; Stickney - moderate

Surface runoff: Beadle - low; Stickney - low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Dudley soils which have more exchangeable sodium in the subsoil than the Stickney soil in microlows on footslopes
Poorly drained Tetonka soils in basins

Similar inclusions:

Soils that have less clay in the subsoil than the Beadle soil

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers
Suitability for cropland: Fairly well suited

Management concerns:

Beadle - slow permeability; Stickney - slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.
Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Beadle - IIs; Stickney - IIIs

Ecological site: Beadle - Clayey; Stickney - Clayey

Conservation tree and shrub group: Beadle - 4; Stickney - 4

Forage suitability group: Beadle - Clayey Subsoil; Stickney - Clayey Subsoil

BeB—Beadle-Stickney complex, 1 to 6 percent slopes

Composition

Beadle and similar soils: 55 to 65 percent
Stickney and similar soils: 25 to 35 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Beadle - summits and backslopes; Stickney - footslopes

Slope range: Beadle - 2 to 6 percent; Stickney - 1 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 50 acres

Typical Profile

Beadle

Surface layer:

0 to 7 inches - dark gray loam

Subsoil:

7 to 16 inches - dark grayish brown clay loam

16 to 35 inches - light brownish gray, calcareous clay loam

Underlying layer:

35 to 80 inches - light brownish gray, calcareous clay loam with relict redox features

Stickney**Surface layer:**

0 to 7 inches - dark gray silt loam

Subsurface layer:

7 to 10 inches - gray silt loam

Transitional layer:

10 to 13 inches - dark grayish brown and gray silty clay loam

Subsoil:

13 to 22 inches - dark grayish brown clay loam

22 to 40 inches - light brownish gray, calcareous clay loam

Underlying layer:

40 to 80 inches - grayish brown, calcareous clay loam

Soil Properties and Qualities

Drainage class: Beadle - well drained; Stickney - moderately well drained

Depth to restrictive feature: Beadle - none; Stickney - none

Depth to contrasting parent material: Beadle - greater than 60 inches;
Stickney - greater than 60 inches

Depth to high water table: Beadle - 4 to 6 feet; Stickney - 3.5 to 5 feet

Flooding: Beadle - none; Stickney - none

Ponding: Beadle - none; Stickney - none

Permeability: Beadle - slow; Stickney - slow

Available water capacity: Beadle - high; Stickney - high

Organic matter content: Beadle - moderate; Stickney - moderate

Surface runoff: Beadle - medium; Stickney - low

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Moderately well drained Dudley soils which have more exchangeable sodium in the subsoil than the Stickney soil in microlows on footslopes

Well drained Ethan soils which are calcareous to the surface on shoulders

Poorly drained Tetonka soils in basins

Similar inclusions:

Soils that have less clay in the subsoil than the Beadle soil

Use and Management**Cropland**

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Beadle - water erosion, slow permeability; Stickney - slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.

Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Beadle - IIIe; Stickney - IIIs

Ecological site: Beadle - Clayey; Stickney - Clayey

Conservation tree and shrub group: Beadle - 4; Stickney - 4

Forage suitability group: Beadle - Clayey Subsoil; Stickney - Clayey Subsoil

BfA—Beadle-Stickney complex, 0 to 2 percent slopes, very stony

Composition

Beadle and similar soils: 55 to 65 percent
Stickney and similar soils: 25 to 35 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains
Landform position: Beadle - summits and backslopes; Stickney - footslopes
Slope range: Beadle - 0 to 2 percent; Stickney - 0 to 2 percent
Shape of areas: Irregular
Size of areas: 10 to 100 acres

Typical Profile

Beadle

Surface layer:

0 to 7 inches - dark gray loam

Subsoil:

7 to 16 inches - dark grayish brown clay loam

16 to 35 inches - light brownish gray, calcareous clay loam

Underlying layer:

35 to 80 inches - light brownish gray, calcareous clay loam with relict redox features

Stickney

Surface layer:

0 to 7 inches - dark gray silt loam

Subsurface layer:

7 to 10 inches - gray silt loam

Transitional layer:

10 to 13 inches - dark grayish brown and gray silty clay loam

Subsoil:

13 to 22 inches - dark grayish brown clay loam

22 to 40 inches - light brownish gray, calcareous clay loam

Underlying layer:

40 to 80 inches - grayish brown, calcareous clay loam

Soil Properties and Qualities

Drainage class: Beadle - well drained; Stickney - moderately well drained

Depth to restrictive feature: Beadle - none; Stickney - none

Depth to contrasting parent material: Beadle - greater than 60 inches;
Stickney - greater than 60 inches

Depth to high water table: Beadle - 4 to 6 feet; Stickney - 3.5 to 5 feet

Flooding: Beadle - none; Stickney - none

Ponding: Beadle - none; Stickney - none

Permeability: Beadle - slow; Stickney - slow

Available water capacity: Beadle - high; Stickney - high

Organic matter content: Beadle - moderate; Stickney - moderate

Surface runoff: Beadle - low; Stickney - low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Dudley soils which have more exchangeable sodium in the subsoil than the Stickney soil in microlows on footslopes

Poorly drained Tetonka soils in basins

Similar inclusions:

Soils that have less clay in the subsoil than the Beadle soil

Use and Management

Rangeland

Main crops: Unsited

Suitability for cropland: Unsited

Management concerns:

Beadle - numerous stones, slow permeability; Stickney - numerous stones, slow permeability

Management measures:

Proper grazing management helps to maintain plant vigor.

Interpretive Groups

Land capability classification: Beadle - VIIs; Stickney - VIIs

Ecological site: Beadle - Clayey; Stickney - Clayey

Conservation tree and shrub group: Beadle - 10; Stickney - 10

Forage suitability group: Beadle - Not Suited; Stickney - Not Suited

BfB—Beadle-Stickney complex, 1 to 6 percent slopes, very stony

Composition

Beadle and similar soils: 55 to 65 percent

Stickney and similar soils: 25 to 35 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains (fig. 7)

Landform position: Beadle - summits and backslopes; Stickney - footslopes

Slope range: Beadle - 2 to 6 percent; Stickney - 1 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 50 acres

Typical Profile

Beadle

Surface layer:

0 to 7 inches - dark gray loam

Subsoil:

7 to 16 inches - dark grayish brown clay loam

16 to 35 inches - light brownish gray, calcareous clay loam

Underlying layer:

35 to 80 inches - light brownish gray, calcareous clay loam with relict redox features

Stickney**Surface layer:**

0 to 7 inches - dark gray silt loam

Subsurface layer:

7 to 10 inches - gray silt loam

Transitional layer:

10 to 13 inches - dark grayish brown and gray silty clay loam

Subsoil:

13 to 22 inches - dark grayish brown clay loam

22 to 40 inches - light brownish gray, calcareous clay loam

Underlying layer:

40 to 80 inches - grayish brown, calcareous clay loam

Soil Properties and Qualities

Drainage class: Beadle - well drained; Stickney - moderately well drained

Depth to restrictive feature: Beadle - none; Stickney - none

Depth to contrasting parent material: Beadle - greater than 60 inches;
Stickney - greater than 60 inches

Depth to high water table: Beadle - 4 to 6 feet; Stickney - 3.5 to 5 feet

Flooding: Beadle - none; Stickney - none

Ponding: Beadle - none; Stickney - none

Permeability: Beadle - slow; Stickney - slow

Available water capacity: Beadle - high; Stickney - high

Organic matter content: Beadle - moderate; Stickney - moderate

Surface runoff: Beadle - medium; Stickney - low



Figure 7. Scattered stones cover the surface in an area of Beadle-Stickney complex, 1 to 6 percent slopes, very stony in Cornwall Township.

Inclusions

Contrasting inclusions: (May have significant management concerns)

- Moderately well drained Dudley soils which have more exchangeable sodium in the subsoil than the Stickney soil in microlows on footslopes
- Well drained Ethan soils which are calcareous to the surface on shoulders
- Poorly drained Tetonka soils in basins

Similar inclusions:

- Soils that have less clay in the subsoil than the Beadle soil

Use and Management

Rangeland

- Main crops: Unsited
- Suitability for cropland: Unsited

Management concerns:

- Beadle - numerous stones, water erosion, slow permeability;
- Stickney - numerous stones, slow permeability

Management measures:

- Proper grazing management helps to maintain plant vigor and control erosion.

Interpretive Groups

Land capability classification: Beadle - VIIs; Stickney - VIIs

Ecological site: Beadle - Clayey; Stickney - Clayey

Conservation tree and shrub group: Beadle - 10; Stickney - 10

Forage suitability group: Beadle - Not Suited; Stickney - Not Suited

Bg—Bearden silt loam, 0 to 2 percent slopes

Composition

- Bearden and similar soils: 80 to 90 percent
- Contrasting inclusions: 10 to 20 percent

Setting

Landform: Lake plains

Landform position: Footslopes

Slope range: 0 to 2 percent

Shape of areas: Irregular

Size of areas: 5 to 100 acres

Typical Profile

Surface layer:

- 0 to 7 inches - dark gray, calcareous silt loam

Transitional layer:

- 7 to 12 inches - gray, calcareous silt loam

Subsoil:

- 12 to 16 inches - light gray, calcareous silt loam
- 16 to 38 inches - pale yellow, calcareous silt loam with redox concentrations in the upper part and redox concentrations and depletions in the lower part

Underlying layer:

- 38 to 80 inches - pale yellow, calcareous, varved silt loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Somewhat poorly drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: 1.5 to 3.5 feet

Flooding: None

Ponding: None

Permeability: Moderately slow in the solum and moderate to slow in the underlying material

Available water capacity: High

Organic matter content: Moderate

Surface runoff: Low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Beotia soils which are dark to a depth greater than 16 inches on footslopes

Poorly drained Colvin soils on toeslopes

Well drained Huffton soils which contain nests of salt and gypsum near the surface on shoulders

Poorly drained Tonka soils in basins

Use and Management

Cropland

Main crops: Corn, barley, spring wheat, sunflowers, and soybeans

Suitability for cropland: Fairly well suited

Management concerns:

Wind erosion, high content of lime adversely affects the availability of plant nutrients

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control wind erosion.

Rotations including grasses and legumes help to control wind erosion and maintain organic matter content and tilth.

Interpretive Groups

Land capability classification: IIe

Ecological site: Limy Subirrigated

Conservation tree and shrub group: 2KK

Forage suitability group: Subirrigated

Bk—Bearden-Tonka silt loams, 0 to 2 percent slopes

Composition

Bearden and similar soils: 55 to 65 percent

Tonka and similar soils: 25 to 35 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Bearden - footslopes; Tonka - basins

Slope range: Bearden - 0 to 2 percent; Tonka - 0 to 1 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Bearden

Surface layer:

0 to 7 inches - dark gray, calcareous silt loam

Transitional layer:

7 to 12 inches - gray, calcareous silt loam

Subsoil:

12 to 16 inches - light gray, calcareous silt loam

16 to 38 inches - pale yellow, calcareous silt loam with redox concentrations in the upper part and redox concentrations and depletions in the lower part

Underlying layer

38 to 80 inches - pale yellow, calcareous, varved silt loam with redox concentrations and depletions

Tonka

Surface layer:

0 to 8 inches - dark gray silt loam

Subsurface layer:

8 to 16 inches - light gray, silt loam with redox concentrations

Subsoil:

16 to 35 inches - dark gray silty clay

35 to 41 inches - gray silty clay

Underlying layer:

41 to 68 inches - light gray, calcareous clay loam with redox concentrations and depletions

68 to 80 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Bearden - somewhat poorly drained; Tonka - poorly drained

Depth to restrictive feature: Bearden - none; Tonka - none

Depth to contrasting parent material: Bearden - greater than 60 inches;
Tonka - greater than 60 inches

Depth to high water table: Bearden - 1.5 to 3.5 feet; Tonka - plus 1 to 1.5 feet

Flooding: Bearden - none; Tonka - none

Ponding: Bearden - none; Tonka - frequent for long periods

Permeability: Bearden - moderately slow in the solum and moderate to slow in the underlying material; Tonka - slow

Available water capacity: Bearden - high; Tonka - high

Organic matter content: Bearden - moderate; Tonka - high

Surface runoff: Bearden - low; Tonka - negligible

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Beotia soils which are not calcareous at or near the surface on footslopes

Poorly drained Colvin soils on toeslopes

Somewhat poorly drained Winship soils on toeslopes

Use and Management

Cropland

Main crops: Corn, barley, spring wheat, sunflowers, and soybeans

Suitability for cropland: Fairly well suited

Management concerns:

Bearden - wind erosion, high content of lime adversely affects the availability of plant nutrients; Tonka - ponding, high water table, slow permeability

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control wind erosion.

Rotations including grasses and legumes help to control wind erosion and maintain organic matter content and tilth.

In most years the Tonka soil is better suited to late-planted crops. Deferred tillage when the Tonka soil is wet helps to maintain tilth and limit compaction.

Maintain existing drainage systems to remove excess water on the Tonka soil.

Interpretive Groups

Land capability classification: Bearden - IIe; Tonka - IVw

Ecological site: Bearden - Limy Subirrigated; Tonka - Wet Meadow

Conservation tree and shrub group: Bearden - 2KK; Tonka - 10

Forage suitability group: Bearden - Subirrigated; Tonka - Wet

Bo—Beotia silt loam, 0 to 2 percent slopes

Composition

Beotia and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Footslopes

Slope range: 0 to 2 percent

Shape of areas: Irregular

Size of areas: 20 to 500 acres

Typical Profile

Surface layer:

0 to 9 inches - dark gray silt loam

Subsoil:

9 to 17 inches - dark grayish brown silty clay loam

17 to 21 inches - light olive brown silt loam

21 to 39 inches - pale yellow, calcareous silt loam

Underlying layer:

39 to 80 inches - pale yellow, calcareous, varved silty clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Well drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: 4 to 6 feet

Flooding: None

Ponding: None

Permeability: Moderate in the solum and moderate to slow in the underlying material

Available water capacity: High

Organic matter content: High

Surface runoff: Low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Great Bend soils which are dark to a depth less than 16 inches on backslopes

Moderately well drained Harmony soils which have more clay and less silt in the subsoil on footslopes

Poorly drained Tonka soils in basins

Somewhat poorly drained Winship soils which are dark to a depth greater than 30 inches on toeslopes

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Well suited

Management concerns:

Few limitations except to conserve moisture

Management measures:

Managing tillage and leaving crop residue conserves moisture and helps to maintain organic matter content and tilth.

Interpretive Groups

Land capability classification: IIc

Ecological site: Loamy

Conservation tree and shrub group: 1

Forage suitability group: Loam

Br—Beotia-Rondell silt loams, 0 to 3 percent slopes

Composition

Beotia and similar soils: 40 to 55 percent

Rondell and similar soils: 20 to 40 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Lake plains

Landform position: Beotia - footslopes; Rondell - lower footslopes

Slope range: Beotia - 0 to 2 percent; Rondell - 0 to 3 percent

Shape of areas: Irregular

Size of areas: 20 to 100 acres

Typical Profile

Beotia

Surface layer:

0 to 9 inches - dark gray silt loam

Subsoil:

9 to 17 inches - dark grayish brown silty clay loam

17 to 21 inches - light olive brown silt loam

21 to 39 inches - pale yellow, calcareous silt loam

Underlying layer:

39 to 80 inches - pale yellow, calcareous, varved silty clay loam with redox concentrations and depletions

Rondell**Surface layer:**

0 to 7 inches - dark gray, calcareous silt loam

Subsurface layer:

7 to 11 inches - dark grayish brown, calcareous silt loam

Subsoil:

11 to 21 inches - light gray, calcareous silt loam

21 to 36 inches - light yellowish brown, calcareous silt loam

Underlying layer:

36 to 80 inches - light yellowish brown, calcareous, varved silt loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Beotia - well drained; Rondell - moderately well drained

Depth to restrictive feature: Beotia - none; Rondell - none

Depth to contrasting parent material: Beotia - greater than 60 inches;
Rondell - greater than 60 inches

Depth to high water table: Beotia - 4 to 6 feet; Rondell - 3.5 to 5 feet

Flooding: Beotia - none; Rondell - none

Ponding: Beotia - none; Rondell - none

Permeability: Beotia - moderate in the solum and moderate to slow in the underlying material; Rondell - moderate in the solum and moderate to slow in the underlying material

Available water capacity: Beotia - high; Rondell - high

Organic matter content: Beotia - high; Rondell - moderate

Surface runoff: Beotia - low; Rondell - low

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Somewhat poorly drained Bearden soils on footslopes

Well drained Great Bend soils which are not calcareous at or near the surface and are dark to a depth less than 16 inches on backslopes

Well drained Putney soils which are not calcareous at or near the surface, have gypsum and other salts within a depth of 20 inches, and are dark to a depth less than 16 inches on backslopes

Poorly drained Tonka soils in basins

Similar inclusions:

Soils that have salts closer to the surface than the Rondell soil

Use and Management**Cropland**

Main crops: Barley, spring wheat, alfalfa, corn, sunflowers, and soybeans

Suitability for cropland: Well suited

Management concerns:

Beotia - few limitations except to conserve moisture; Rondell - wind erosion, high content of lime adversely affects the availability of plant nutrients

Management measures:

Minimizing tillage and leaving crop residue on the surface help to conserve moisture and control wind erosion.

Rotations including grasses and legumes help to control wind erosion and maintain fertility, organic matter content, and tilth.

Interpretive Groups

Land capability classification: Beotia - IIc; Rondell - IIe

Ecological site: Beotia - Silty; Rondell - Limy Subirrigated

Conservation tree and shrub group: Beotia - 1; Rondell - 1K

Forage suitability group: Beotia - Loam; Rondell - Limy Upland

Bs—Beotia-Winship silt loams, 0 to 2 percent slopes**Composition**

Beotia and similar soils: 55 to 65 percent

Winship and similar soils: 25 to 35 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Beotia - footslopes; Winship - toeslopes

Slope range: Beotia - 0 to 2 percent; Winship - 0 to 1 percent

Shape of areas: Long and narrow

Size of areas: 10 to 100 acres

Typical Profile**Beotia****Surface layer:**

0 to 9 inches - dark gray silt loam

Subsoil:

9 to 17 inches - dark grayish brown silty clay loam

17 to 21 inches - light olive brown silt loam

21 to 39 inches - pale yellow, calcareous silt loam

Underlying layer

39 to 80 inches - pale yellow, calcareous, varved silty clay loam with redox concentrations and depletions

Winship**Surface layer:**

0 to 25 inches - dark gray silt loam

Transitional layer:

25 to 34 inches - gray silt loam

Subsoil:

34 to 44 inches - dark gray silty clay loam

44 to 57 inches - dark grayish brown silty clay loam

57 to 72 inches - light brownish gray, with redox concentrations,

Underlying layer:

72 to 80 inches - pale yellow, calcareous, varved silt loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Beotia - moderately well drained; Winship - somewhat poorly drained

Depth to restrictive feature: Beotia - none; Winship - none

Depth to contrasting parent material: Beotia - greater than 60 inches; Winship - greater than 60 inches

Depth to high water table: Beotia - 3.5 to 5 feet; Winship - 1.5 to 3.5 feet

Flooding: Beotia - none; Winship - none

Ponding: Beotia - none; Winship - none

Permeability: Beotia - moderate in the solum and moderate to slow in the underlying material; Winship - moderately slow

Available water capacity: Beotia - high; Winship - high

Organic matter content: Beotia - high; Winship - high

Surface runoff: Beotia - low; Winship - low

Other properties: Runoff water flows over both soils during periods of rainfall or snowmelt.

Inclusions

Contrasting inclusions: (May have significant management concerns)

Somewhat poorly drained Bearden soils which are calcareous at or near the surface on lower footslopes

Moderately well drained Harmony soils which have more clay and less silt in the subsoil than the Beotia soil on footslopes

Poorly drained Tonka soils in basins

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, and sunflowers

Suitability for cropland: Well suited

Management concerns:

Beotia - few limitations except to conserve moisture; Winship - wetness

Management measures:

Minimizing tillage and leaving crop residue on the surface help to conserve moisture.

Deferring tillage when the Winship soil is wet helps to limit compaction.

Interpretive Groups

Land capability classification: Beotia - IIc; Winship - IIw

Ecological site: Beotia - Loamy Overflow; Winship - Loamy Overflow

Conservation tree and shrub group: Beotia - 1; Winship - 2

Forage suitability group: Beotia - Overflow; Winship - Subirrigated

Bt—Beotia-Winship silt loams, till substratum, 0 to 2 percent slopes

Composition

Beotia and similar soils: 55 to 65 percent

Winship and similar soils: 25 to 35 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Beotia - footslopes; Winship - toeslopes

Slope range: Beotia - 0 to 2 percent; Winship - 0 to 1 percent

Shape of areas: Long and narrow

Size of areas: 10 to 100 acres

Typical Profile

Beotia

Surface layer:

0 to 12 inches - dark gray silt loam

Subsoil:

12 to 18 inches - dark gray silty clay loam

18 to 27 inches - grayish brown silty clay loam

27 to 39 inches - light gray, calcareous silt loam

39 to 46 inches - pale yellow, calcareous silt loam

Underlying layer

46 to 52 inches - light yellowish brown, calcareous, varved silt loam with redox concentrations and depletions

52 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Winship

Surface layer:

0 to 18 inches - dark gray silt loam

Transitional layer:

18 to 27 inches - grayish brown silt loam

Subsoil:

27 to 35 inches - dark gray silty clay loam

35 to 41 inches - grayish brown silty clay loam

41 to 47 inches - pale yellow, calcareous silt loam with redox concentrations

Underlying layer:

47 to 57 inches - pale yellow, calcareous, varved silt loam with redox concentrations

57 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Beotia - moderately well drained; Winship - somewhat poorly drained

Depth to restrictive feature: Beotia - none; Winship - none

Depth to contrasting parent material: Beotia - greater than 40 inches over glacial till; Winship - greater than 40 inches over glacial till

Depth to high water table: Beotia - 3.5 to 5 feet; Winship - 1.5 to 3.5 feet

Flooding: Beotia - none; Winship - none

Ponding: Beotia - none; Winship - none

Permeability: Beotia - moderate in the solum and moderate to slow in the underlying material; Winship - moderately slow

Available water capacity: Beotia - high; Winship - high

Organic matter content: Beotia - high; Winship - high

Surface runoff: Beotia - low; Winship - low

Other properties: Runoff water flows over both soils during periods of rainfall or snowmelt.

Inclusions

Contrasting inclusions: (May have significant management concerns)

Somewhat poorly drained Bearden soils which are calcareous at or near the surface on footslopes

Moderately well drained Harmony soils which have more clay and less silt in the subsoil than the Beotia soil on footslopes

Poorly drained Tonka soils in basins

Similar inclusions:

Soils that are greater than 60 inches to loamy glacial till

Use and Management

Cropland

Main crops: Corn, soybeans, sunflowers, and spring wheat

Suitability for cropland: Well suited

Management concerns:

Beotia - few limitations except to conserve moisture; Winship - wetness

Management measures:

Minimizing tillage and leaving crop residue on the surface help to conserve moisture.

Deferring tillage when the Winship soil is wet helps to limit compaction.

Interpretive Groups

Land capability classification: Beotia - IIc; Winship - IIw

Ecological site: Beotia - Loamy Overflow; Winship - Loamy Overflow

Conservation tree and shrub group: Beotia - 1; Winship - 2

Forage suitability group: Beotia - Overflow; Winship - Subirrigated

Bu—Bon loam, 0 to 2 percent slopes

Composition

Bon and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Flood plains

Landform position: High flood plains

Slope range: 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 150 acres

Typical Profile

Surface layer:

0 to 8 inches - dark gray, calcareous loam

Subsurface layer:

8 to 14 inches - gray, calcareous loam

Subsoil:

14 to 26 inches - gray, calcareous loam

26 to 40 inches - grayish brown, calcareous silt loam

40 to 49 inches - very dark gray, calcareous loam

Underlying layer:

49 to 69 inches - grayish brown, calcareous sandy loam with redox concentrations and depletions

69 to 80 inches - gray, calcareous clay loam with redox depletions

Soil Properties and Qualities

Drainage class: Moderately well drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: 3 to 5 feet

Flooding: Rare for brief periods

Ponding: None

Permeability: Moderate

Available water capacity: High

Organic matter content: High

Surface runoff: Low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Somewhat poorly drained Lamo soils which have more silt and less sand on low flood plains

Moderately well drained Northville soils which have a sodium-affected subsoil on high flood plains

Similar inclusions:

Soils that are not calcareous within a depth of 20 inches

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Well suited

Management concerns:

Few limitations except to conserve moisture

Management measures:

Managing tillage and leaving crop residue conserves moisture and helps to maintain organic matter content and tilth.

Interpretive Groups

Land capability classification: IIc

Ecological site: Loamy

Conservation tree and shrub group: 1

Forage suitability group: Loam

Bw—Bon loam, channeled

Composition

Bon and similar soils: 75 to 90 percent

Contrasting inclusions: 10 to 25 percent

Setting

Landform: Flood plains

Landform position: Low flood plains

Slope range: 0 to 2 percent
Shape of areas: Long and narrow
Size of areas: 50 to 500 acres

Typical Profile

Surface layer:

0 to 8 inches - dark gray, calcareous loam

Subsurface layer:

8 to 14 inches - gray, calcareous loam

Subsoil:

14 to 26 inches - gray, calcareous loam

26 to 40 inches - grayish brown, calcareous silt loam

40 to 49 inches - very dark gray, calcareous loam

Underlying layer:

49 to 69 inches - grayish brown, calcareous sandy loam with redox concentrations and depletions

69 to 80 inches - gray, calcareous clay loam with redox depletions

Soil Properties and Qualities

Drainage class: Moderately well drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: 3 to 5 feet

Flooding: Frequent for brief periods

Ponding: None

Permeability: Moderate

Available water capacity: High

Organic matter content: High

Surface runoff: Low

Other properties: These areas typically are dissected by meandering stream channels

Inclusions

Contrasting inclusions: (May have significant management concerns)

Somewhat poorly drained Lamo soils which are calcareous to the surface on low flood plains

Moderately well drained Northville soils which have a sodium-affected subsoil on high flood plains

Use and Management

Rangeland

Main crops: Unsited

Suitability for cropland: Unsited

Management concerns:

Flooding, stream channel severely limits use of machinery

Management measures:

Proper grazing management helps to maintain plant vigor and control stream bank erosion.

Interpretive Groups

Land capability classification: Vlw

Ecological site: Loamy Overflow

Conservation tree and shrub group: 1

Forage suitability group: Overflow

BxD—Buse-Barnes loams, 9 to 20 percent slopes**Composition**

Buse and similar soils: 45 to 60 percent
Barnes and similar soils: 25 to 40 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Moraines

Landform position: Buse - shoulders; Barnes - backslopes

Slope range: Buse - 9 to 20 percent; Barnes - 9 to 15 percent

Shape of areas: Irregular

Size of areas: 10 to 50 acres

Typical Profile**Buse****Surface layer:**

0 to 7 inches - dark gray, calcareous loam

Subsoil:

7 to 21 inches - light brownish gray, calcareous loam

21 to 35 inches - light brownish gray, calcareous clay loam with relict redox features

Underlying layer:

35 to 63 inches - light yellowish brown, calcareous clay loam with relict redox features

63 to 80 inches - light brownish gray, calcareous clay loam with relict redox features

Barnes**Surface layer:**

0 to 7 inches - dark gray loam

Subsoil:

7 to 15 inches - dark grayish brown loam

15 to 30 inches - light brownish gray, calcareous loam

30 to 38 inches - light yellowish brown, calcareous loam with relict redox features

Underlying layer:

38 to 67 inches - light yellowish brown, calcareous clay loam with relict redox features

67 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Buse - well drained; Barnes - well drained

Depth to restrictive feature: Buse - none; Barnes - none

Depth to contrasting parent material: Buse - greater than 60 inches;
Barnes - greater than 60 inches

Depth to high water table: Buse - greater than 6 feet; Barnes - greater than 6 feet

Flooding: Buse - none; Barnes - none

Ponding: Buse - none; Barnes - none

Permeability: Buse - moderately slow; Barnes - moderately slow

Available water capacity: Buse - high; Barnes - high

Organic matter content: Buse - moderately low; Barnes - moderate

Surface runoff: Buse - high; Barnes - high

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Aastad soils which are dark to a depth greater than 16 inches on footslopes

Somewhat excessively drained Renshaw soils which have gravelly material within a depth of 20 inches on backslopes

Similar inclusions:

Soils that have a thinner surface layer than the Buse soil

Soils that have more clay in the subsoil than the Barnes soil

Use and Management

Rangeland

Main crops: Buse - generally not suited, Barnes - spring wheat and alfalfa

Suitability for cropland: Generally unsuited

Management concerns:

Buse - water and wind erosion, high content of lime adversely affects the availability of plant nutrients; Barnes - water erosion

Management measures:

Proper grazing management helps to maintain plant vigor and control erosion.

Seed cultivated areas to adapted grasses.

Interpretive Groups

Land capability classification: Buse - VIe; Barnes - IVe

Ecological site: Buse - Thin Loamy; Barnes - Loamy

Conservation tree and shrub group: Buse - 10; Barnes - 3

Forage suitability group: Buse - Limy Upland; Barnes - Loam

ByE—Buse-Barnes loams, 9 to 40 percent slopes, very stony

Composition

Buse and similar soils: 45 to 65 percent

Barnes and similar soils: 25 to 40 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Moraines (fig. 8)

Landform position: Buse - shoulders; Barnes - backslopes

Slope range: Buse - 9 to 40 percent; Barnes - 9 to 25 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Buse

Surface layer:

0 to 7 inches - dark gray, calcareous loam

Subsoil:

7 to 21 inches - light brownish gray, calcareous loam

21 to 35 inches - light brownish gray, calcareous clay loam with relict redox features

Underlying layer:

35 to 63 inches - light yellowish brown, calcareous clay loam with relict redox features

63 to 80 inches - light brownish gray, calcareous clay loam with relict redox features

Barnes**Surface layer:**

0 to 7 inches - dark gray loam

Subsoil:

7 to 15 inches - dark grayish brown loam

15 to 30 inches - light brownish gray, calcareous loam

30 to 38 inches - light yellowish brown, calcareous loam with relict redox features

Underlying layer:

38 to 67 inches - light yellowish brown, calcareous clay loam with relict redox features

67 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Buse - well drained; Barnes - well drained

Depth to restrictive feature: Buse - none; Barnes - none



Figure 8. Scattered stones cover the surface in an area of Buse-Barnes loams, 9 to 40 percent slopes, very stony map unit along the James River.

Depth to contrasting parent material: Buse - greater than 60 inches;

Barnes - greater than 60 inches

Depth to high water table: Buse - greater than 6 feet; Barnes - greater than 6 feet

Flooding: Buse - none; Barnes - none

Ponding: Buse - none; Barnes - none

Permeability: Buse - moderately slow; Barnes - moderately slow

Available water capacity: Buse - high; Barnes - high

Organic matter content: Buse - moderate; Barnes - moderate

Surface runoff: Buse - very high; Barnes - high

Other properties: Scattered stones and boulders occupy the surface.

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Aastad soils which are dark to a depth greater than 16 inches on footslopes

Somewhat excessively drained Renshaw soils which have gravelly material within a depth of 20 inches on backslopes

Similar inclusions:

Soils that have a thinner surface layer than the Buse soil

Soils that have more clay in the subsoil than the Barnes soil

Use and Management

Rangeland

Main crops: Unsuit

Suitability for cropland: Unsuit

Management concerns:

Buse - numerous stones, water and wind erosion, high content of lime adversely affects the availability of plant nutrients; Barnes - numerous stones, water erosion

Management measures:

Proper grazing management helps to maintain plant vigor and control erosion.

Interpretive Groups

Land capability classification: Buse - VII_s; Barnes - VII_s

Ecological site: Buse - Thin Loamy; Barnes - Loamy

Conservation tree and shrub group: Buse - 10; Barnes - 10

Forage suitability group: Buse - Not Suited; Barnes - Not Suited

BzE—Buse-Langhei complex, 15 to 40 percent slopes

Composition

Buse and similar soils: 45 to 55 percent

Langhei and similar soils: 30 to 45 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Moraines

Landform position: Buse - shoulders and backslopes; Langhei - shoulders

Slope range: Buse - 15 to 40 percent; Langhei - 15 to 40 percent

Shape of areas: Irregular

Size of areas: 10 to 50 acres

Typical Profile

Buse

Surface layer:

0 to 7 inches - dark gray, calcareous loam

Subsoil:

7 to 21 inches - light brownish gray, calcareous loam

21 to 35 inches - light brownish gray, calcareous clay loam with relict redox features

Underlying layer:

35 to 63 inches - light yellowish brown, calcareous clay loam with relict redox features

63 to 80 inches - light brownish gray, calcareous clay loam with relict redox features

Langhei

Surface layer:

0 to 4 inches - dark gray, calcareous clay loam

Subsoil:

4 to 15 inches - light brownish gray, calcareous loam

Underlying layer:

15 to 55 inches - light yellowish brown, calcareous loam with relict redox features

55 to 80 inches - pale yellow, calcareous clay loam with relict redox features

Soil Properties and Qualities

Drainage class: Buse - well drained; Langhei - well drained

Depth to restrictive feature: Buse - none; Langhei - none

Depth to contrasting parent material: Buse - greater than 60 inches;
Langhei - greater than 60 inches

Depth to high water table: Buse - greater than 6 feet; Langhei - greater than 6 feet

Flooding: Buse - none; Langhei - none

Ponding: Buse - none; Langhei - none

Permeability: Buse - moderately slow; Langhei - moderately slow

Available water capacity: Buse - high; Langhei - high

Organic matter content: Buse - moderately low; Langhei - low

Surface runoff: Buse - high; Langhei - high

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Aastad soils which are dark to a depth greater than 16 inches on footslopes

Well drained Barnes and Forman soils which are dark to a depth greater than 7 inches on backslopes

Somewhat excessively drained Renshaw soils which have gravelly material within a depth of 20 inches on backslopes

Use and Management

Rangeland

Main crops: Unsited

Suitability for cropland: Unsited

Management concerns:

Water and wind erosion, high content of lime adversely affects the availability of plant nutrients

Management measures:

Proper grazing management helps to maintain plant vigor and control erosion.

Interpretive Groups

Land capability classification: Buse - VIIe; Langhei - VIIe

Ecological site: Buse - Thin Loamy; Langhei - Thin Loamy

Conservation tree and shrub group: Buse - 10; Langhei - 10

Forage suitability group: Buse - Not Suited; Langhei - Not Suited

Ca—Camtown-Turton loams, 0 to 2 percent slopes**Composition**

Camtown and similar soils: 45 to 60 percent

Turton and similar soils: 25 to 40 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Lake plains

Landform position: Camtown - summits and backslopes; Turton - footslopes

Slope range: Camtown - 0 to 2 percent; Turton - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 20 to 150 acres

Typical Profile**Camtown****Surface layer:**

0 to 8 inches - very dark gray loam

Subsurface layer:

8 to 14 inches - very dark gray loam

Transitional layer:

14 to 19 inches - dark grayish brown loam

Subsoil:

19 to 36 inches - dark grayish brown loam

36 to 48 inches - pale yellow, calcareous silt loam with redox concentrations

Underlying layer:

48 to 70 inches - light yellowish brown, calcareous very fine sandy loam with redox concentrations

70 to 80 inches - pale yellow, calcareous very fine sandy loam with redox concentrations and depletions

Turton**Surface layer:**

0 to 8 inches - dark gray loam

Subsurface layer:

8 to 10 inches - gray very fine sandy loam

Subsoil:

- 10 to 14 inches - dark gray silty clay loam
- 14 to 24 inches - dark grayish brown silty clay loam
- 24 to 38 inches - light gray, calcareous silt loam with redox concentrations

Underlying layer:

- 38 to 80 inches - pale yellow, calcareous very fine sandy loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Camtown - moderately well drained; Turton - moderately well drained

Depth to restrictive feature: Camtown - none; Turton - natric-top depth ranges from 9 to 22 inches

Depth to contrasting parent material: Camtown - greater than 60 inches; Turton - greater than 60 inches

Depth to high water table: Camtown - 3.5 to 5 feet; Turton - 3.5 to 5 feet

Flooding: Camtown - none; Turton - none

Ponding: Camtown - none; Turton - none

Permeability: Camtown - slow; Turton - slow

Available water capacity: Camtown - high; Turton - moderate

Organic matter content: Camtown - moderate; Turton - moderate

Surface runoff: Camtown - low; Turton - low

Inclusions**Contrasting inclusions: (May have significant management concerns)**

- Moderately well drained Gardena soils which do not have a sodium-affected subsoil on footslopes
- Moderately well drained Glyndon soils which are calcareous at or near the surface on footslopes

Similar inclusions:

- Soils that have more very fine sand and less silt in the surface layer

Use and Management**Cropland**

- Main crops: Spring wheat, corn, alfalfa, barley, sunflowers, and soybeans
- Suitability for cropland: Poorly suited

Management concerns:

- Camtown - slow permeability; Turton - sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability

Management measures:

- Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.
- Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Camtown - IIIs; Turton - IVs

Ecological site: Camtown - Clayey; Turton - Claypan

Conservation tree and shrub group: Camtown - 4; Turton - 9C

Forage suitability group: Camtown - Clayey Subsoil; Turton - Claypan

Cf—Cavour-Ferney loams, 0 to 2 percent slopes

Composition

Cavour and similar soils: 50 to 60 percent

Ferney and similar soils: 30 to 40 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains (fig. 9)

Landform position: Cavour - summits and backslopes; Ferney - footslopes

Slope range: Cavour - 0 to 2 percent; Ferney - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Cavour

Surface layer:

0 to 5 inches - dark gray loam

Subsurface layer:

5 to 9 inches - light brownish gray silt loam

Subsoil:

9 to 18 inches - gray silty clay

18 to 22 inches - grayish brown clay loam with masses of salt

22 to 45 inches - light brownish gray, calcareous clay loam with masses of salt

Underlying layer:

45 to 65 inches - light gray, calcareous clay loam

65 to 80 inches - pale yellow, calcareous clay loam



Figure 9. Native grass on Cavour-Ferney loams, 0 to 2 percent slopes. The Cavour soil has a Claypan ecological site and the Ferney soil has a Thin Claypan ecological site.

Ferney**Surface layer:**

0 to 3 inches - gray loam

Subsoil:

3 to 10 inches - dark gray clay

10 to 16 inches - dark grayish brown clay with masses of salt and nests of gypsum

16 to 32 inches - light brownish gray, calcareous clay loam with masses of salt and nests of gypsum

Underlying layer:

32 to 63 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

63 to 80 inches - pale yellow, calcareous clay loam with redox concentrations

Soil Properties and Qualities

Drainage class: Cavour - moderately well drained; Ferney - moderately well drained

Depth to restrictive feature: Cavour - natric-top depth ranges from 4 to 18 inches; Ferney - natric-top depth ranges from 0 to 6 inches

Depth to contrasting parent material: Cavour - greater than 60 inches; Ferney - greater than 60 inches

Depth to high water table: Cavour - 3.5 to 5 feet; Ferney - 3.5 to 5 feet

Flooding: Cavour - none; Ferney - none

Ponding: Cavour - none; Ferney - none

Permeability: Cavour - very slow; Ferney - very slow

Available water capacity: Cavour - moderate; Ferney - moderate

Organic matter content: Cavour - moderate; Ferney - moderately low

Surface runoff: Cavour - low; Ferney - low

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Moderately well drained Cresbard soils which have less exchangeable sodium in the subsoil than the Cavour soil on footslopes

Well drained Forman and Peever soils which do not have a sodium-affected subsoil on backslopes

Poorly drained Heil soils in basins

Similar inclusions:

Soils that have shale bedrock within a depth of 60 inches

Use and Management**Cropland**

Main crops: Cavour - spring wheat, alfalfa, sunflowers, and barley;

Ferney - unsuited

Suitability for cropland: Poorly suited

Management concerns:

Sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.

Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Cavour - IVs; Ferney - VI_s

Ecological site: Cavour - Claypan; Ferney - Thin Claypan

Conservation tree and shrub group: Cavour - 9C; Ferney - 10

Forage suitability group: Cavour - Claypan; Ferney - Not Suited

Co—Colvin silty clay loam, saline, 0 to 1 percent slopes

Composition

Colvin and similar soils: 80 to 90 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Lake plains and flood plains

Landform position: Toeslopes

Slope range: 0 to 1 percent

Shape of areas: Irregular

Size of areas: 5 to 100 acres

Typical Profile

Surface layer:

0 to 7 inches - very dark gray, calcareous silty clay loam with masses of salt

Transitional layer:

7 to 14 inches - dark gray, calcareous silt loam with masses of salt

Subsoil:

14 to 31 inches - gray, calcareous silt loam with redox concentrations

31 to 44 inches - light yellowish brown, calcareous silt loam with redox concentrations and depletions

Underlying layer:

44 to 80 inches - light gray, calcareous, varved silt loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Poorly drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: 0 to 1.5 feet

Flooding: None

Ponding: None

Permeability: Moderately slow in the solum and moderate to slow in the underlying material

Available water capacity: Moderate

Organic matter content: High

Surface runoff: Very low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Somewhat poorly drained Bearden soils which have less salts on footslopes

Poorly drained Tonka soils in basins

Use and Management

Cropland

Main crops: Barley, spring wheat, and sunflowers

Suitability for cropland: Generally unsuited

Management concerns:

High water table, wind erosion, high salt and lime content adversely affects the availability of plant nutrients

Management measures:

In most years the soil is better suited to late-planted crops. Leaving crop residue on the surface and deferred tillage when the soil is wet help to maintain tilth, limit compaction, and control wind erosion.

Rotations including grasses and legumes help to control wind erosion and maintain organic matter content and tilth.

Seed cultivated areas to adapted grasses.

Interpretive Groups

Land capability classification: IVw

Ecological site: Saline Subirrigated

Conservation tree and shrub group: 10

Forage suitability group: Saline

Cr—Cresbard-Cavour loams, 0 to 2 percent slopes

Composition

Cresbard and similar soils: 50 to 65 percent

Cavour and similar soils: 25 to 35 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Cresbard - summits and backslopes; Cavour - footslopes

Slope range: Cresbard - 0 to 2 percent; Cavour - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Cresbard

Surface layer:

0 to 6 inches - dark gray loam

Subsurface layer:

6 to 8 inches - gray loam

Transitional layer:

8 to 11 inches - dark gray and gray clay loam

Subsoil:

11 to 22 inches - dark gray clay loam

22 to 28 inches - pale yellow, calcareous clay loam

28 to 38 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Underlying layer:

38 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Cavour**Surface layer:**

0 to 5 inches - dark gray loam

Subsurface layer:

5 to 9 inches - light brownish gray silt loam

Subsoil:

9 to 18 inches - gray silty clay

18 to 22 inches - grayish brown clay loam with masses of salt

22 to 45 inches - light brownish gray, calcareous clay loam with masses of salt

Underlying layer:

45 to 65 inches - light gray, calcareous clay loam

65 to 80 inches - pale yellow, calcareous clay loam

Soil Properties and Qualities

Drainage class: Cresbard - moderately well drained; Cavour - moderately well drained

Depth to restrictive feature: Cresbard - none; Cavour - natric-top depth ranges from 4 to 18 inches

Depth to contrasting parent material: Cresbard - greater than 60 inches; Cavour - greater than 60 inches

Depth to high water table: Cresbard - 3.5 to 5 feet; Cavour - 3.5 to 5 feet

Flooding: Cresbard - none; Cavour - none

Ponding: Cresbard - none; Cavour - none

Permeability: Cresbard - slow; Cavour - very slow

Available water capacity: Cresbard - high; Cavour - moderate

Organic matter content: Cresbard - moderate; Cavour - moderate

Surface runoff: Cresbard - low; Cavour - low

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Moderately well drained Ferney soils which have visible salts within a depth of 16 inches on lower footslopes

Well drained Forman soils which do not have a sodium-affected subsoil on backslopes

Poorly drained Heil soils in basins

Similar inclusions:

Soils that have shale bedrock within a depth of 60 inches

Use and Management**Cropland**

Main crops: Spring wheat, barley, alfalfa, sunflowers, corn, and soybeans

Suitability for cropland: Poorly suited

Management concerns:

Cresbard - slow permeability; Cavour - sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.
Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Cresbard - IIIs; Cavour - IVs

Ecological site: Cresbard - Clayey; Cavour - Claypan

Conservation tree and shrub group: Cresbard - 4; Cavour - 9C

Forage suitability group: Cresbard - Clayey Subsoil; Cavour - Claypan

Cs—Cresbard-Cavour-Heil complex, 0 to 2 percent slopes**Composition**

Cresbard and similar soils: 35 to 45 percent

Cavour and similar soils: 25 to 35 percent

Heil and similar soils: 15 to 25 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Cresbard - summits and backslopes; Cavour - footslopes;
Heil - basins

Slope range: Cresbard - 0 to 2 percent; Cavour - 0 to 2 percent; Heil - 0 to 1 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile**Cresbard****Surface layer:**

0 to 6 inches - dark gray loam

Subsurface layer:

6 to 8 inches - gray loam

Transitional layer:

8 to 11 inches - dark gray and gray clay loam

Subsoil:

11 to 22 inches - dark gray clay loam

22 to 28 inches - pale yellow, calcareous clay loam

28 to 38 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Underlying layer:

38 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Cavour**Surface layer:**

0 to 5 inches - dark gray loam

Subsurface layer:

5 to 9 inches - light brownish gray silt loam

Subsoil:

9 to 18 inches - gray silty clay

18 to 22 inches - grayish brown clay loam with masses of salt

22 to 45 inches - light brownish gray, calcareous clay loam with masses of salt

Underlying layer:

45 to 65 inches - light gray, calcareous clay loam

65 to 80 inches - pale yellow, calcareous clay loam

Heil**Surface layer:**

0 to 2 inches - gray silt loam with redox concentrations

Subsoil:

2 to 24 inches - dark gray silty clay with masses of salt and crystals of gypsum in the lower part

24 to 39 inches - gray, calcareous silty clay loam with masses of salt and crystals of gypsum

39 to 47 inches - light brownish gray, with redox concentrations and redox depletions, calcareous silty clay loam with masses of salt and crystals of gypsum

Underlying layer:

47 to 80 inches - pale olive, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Cresbard - moderately well drained; Cavour - moderately well drained; Heil - poorly drained

Depth to restrictive feature: Cresbard - none; Cavour - natric-top depth ranges from 4 to 18 inches; Heil - natric-top depth ranges from 1 to 4 inches

Depth to contrasting parent material: Cresbard - greater than 60 inches; Cavour - greater than 60 inches; Heil - greater than 40 inches over glacial till

Depth to high water table: Cresbard - 3.5 to 5 feet; Cavour - 3.5 to 5 feet; Heil - plus 1 to 1.5 feet

Flooding: Cresbard - none; Cavour - none; Heil - none

Ponding: Cresbard - none; Cavour - none; Heil - frequent for long periods

Permeability: Cresbard - slow; Cavour - very slow; Heil - very slow

Available water capacity: Cresbard - high; Cavour - moderate; Heil - moderate

Organic matter content: Cresbard - moderate; Cavour - moderate; Heil - moderate

Surface runoff: Cresbard - low; Cavour - low; Heil - negligible

Inclusions**Contrasting inclusions:**

Moderately well drained Ferney soils which have visible salts within a depth of 16 inches in microdepressions

Well drained Peever soils which do not have a sodium-affected subsoil on backslopes

Similar inclusions:

Soils that have a thicker surface layer than the Heil soil

Use and Management**Cropland**

Main crops: Cresbard and Cavour - Spring wheat, barley, alfalfa, and sunflowers;

Heil - unsuited

Suitability for cropland: Poorly suited

Management concerns:

Cresbard - slow permeability; Cavour - sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability; Heil - ponding, high water table, sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the soil surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.

Deferring tillage when the Heil soil is wet helps to limit compaction.

Chiseling or subsoiling when the soils are dry helps to increase permeability.

Interpretive Groups

Land capability classification: Cresbard - IIIs; Cavour - IVs; Heil - VIs

Ecological site: Cresbard - Clayey; Cavour - Claypan; Heil - Closed Depression

Conservation tree and shrub group: Cresbard - 4; Cavour - 9C; Heil - 10

Forage suitability group: Cresbard - Clayey Subsoil; Cavour - Claypan;
Heil - Not Suited

Ct—Crossplain-Tetonka complex, 0 to 1 percent slopes**Composition**

Crossplain and similar soils: 55 to 65 percent

Tetonka and similar soils: 25 to 35 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Crossplain - toeslopes; Tetonka - basins

Slope range: Crossplain - 0 to 1 percent; Tetonka - 0 to 1 percent

Shape of areas: Long and narrow

Size of areas: 10 to 50 acres

Typical Profile**Crossplain****Surface layer:**

0 to 6 inches - dark gray loam

Transitional layer:

6 to 15 inches - dark gray loam

Subsoil:

15 to 30 inches - very dark grayish brown clay loam

30 to 45 inches - light brownish gray, calcareous loam with redox concentrations

45 to 59 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Underlying layer:

59 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Tetonka

Surface layer:

0 to 8 inches - grayish brown silt loam

Subsurface layer:

8 to 13 inches - light gray, silt loam with redox concentrations

Subsoil:

13 to 25 inches - dark gray silty clay

25 to 39 inches - gray silty clay

39 to 47 inches - grayish brown, calcareous clay loam with redox concentrations and depletions

47 to 62 inches - light olive gray, calcareous clay loam with redox concentrations and depletions

Underlying layer:

62 to 80 inches - pale olive, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Crossplain - somewhat poorly drained; Tetonka - poorly drained

Depth to restrictive feature: Crossplain - none; Tetonka - none

Depth to contrasting parent material: Crossplain - greater than 60 inches;
Tetonka - greater than 60 inches

Depth to high water table: Crossplain - 0 to 2 feet; Tetonka - plus 1 to 1 foot

Flooding: Crossplain - frequent for brief periods; Tetonka - none

Ponding: Crossplain - none; Tetonka - frequent for long periods

Permeability: Crossplain - slow; Tetonka - slow

Available water capacity: Crossplain - high; Tetonka - high

Organic matter content: Crossplain - high; Tetonka - high

Surface runoff: Crossplain - low; Tetonka - negligible

Other properties: Runoff water flows over the Crossplain soil during periods of rainfall or snowmelt.

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Davison soils which are calcareous at or near the surface on footslopes

Moderately well drained Prosper soils which have less clay in the subsoil on footslopes

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Crossplain - flooding, high water table; Tetonka - ponding, high water table, slow permeability

Management measures:

These soils are better suited to late-planted crops.

Deferring tillage when the soils are wet help to maintain tilth and limit compaction on the Tetonka soil. Maintain existing drainage systems to remove excess water on the Tetonka soil.

Interpretive Groups

Land capability classification: Crossplain - IIw; Tetonka - IVw

Ecological site: Crossplain - Loamy Overflow; Tetonka - Wet

Conservation tree and shrub group: Crossplain - 2; Tetonka - 10

Forage suitability group: Crossplain - Subirrigated; Tetonka - Wet

Da—Davis-Northville complex, 0 to 2 percent slopes

Composition

Davis and similar soils: 50 to 60 percent

Northville and similar soils: 25 to 40 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Flood plains

Landform position: Davis - microhighs; Northville - microlows

Slope range: Davis - 0 to 2 percent; Northville - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 20 to 200 acres

Typical Profile

Davis

Surface layer:

0 to 6 inches - dark gray loam

Subsoil:

6 to 15 inches - dark grayish brown loam

15 to 28 inches - grayish brown loam

28 to 40 inches - light brownish gray, calcareous loam

40 to 65 inches - grayish brown and dark grayish brown, calcareous clay loam and loam

Underlying layer:

65 to 72 inches - black, calcareous clay loam

72 to 80 inches - light gray, calcareous loam with redox concentrations and redox depletions

Northville

Surface layer:

0 to 5 inches - dark gray silt loam

Transitional layer:

5 to 8 inches - gray silty clay loam

Subsoil:

8 to 22 inches - dark gray silty clay

22 to 42 inches - light brownish gray, calcareous silty clay loam

42 to 58 inches - grayish brown, calcareous silty clay

Underlying layer:

58 to 69 inches - dark gray, calcareous silty clay

69 to 80 inches - light gray, calcareous clay loam with redox concentrations

Soil Properties and Qualities

Drainage class: Davis - moderately well drained; Northville - moderately well drained

Depth to restrictive feature: Davis - none; Northville - none

Depth to contrasting parent material: Davis - greater than 60 inches; Northville - greater than 60 inches

Depth to high water table: Davis - 3 to 5 feet; Northville - 3 to 5 feet

Flooding: Davis - rare for brief periods; Northville - rare for brief periods

Ponding: Davis - none; Northville - none

Permeability: Davis - moderate; Northville - slow

Available water capacity: Davis - high; Northville - moderate

Organic matter content: Davis - high; Northville - moderate

Surface runoff: Davis - low; Northville - low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Somewhat poorly drained Farmsworth soils which have more exchangeable sodium in the subsoil than the Northville soil on high flood plains

Moderately well drained Woonsocket soils which have more sand and less clay in the surface layer and subsoil than the Northville soils on footslopes

Similar inclusions:

Soils that are calcareous closer to the surface than the Davis soil

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Davis - few limitations except to conserve moisture; Northville - slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help conserve moisture and maintain organic matter content and tilth.

Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Davis - IIc; Northville - IIIs

Ecological site: Davis - Loamy Overflow; Northville - Clayey

Conservation tree and shrub group: Davis - 1; Northville - 4

Forage suitability group: Davis - Overflow; Northville - Clayey Subsoil

Db—Davison loam, 0 to 2 percent slopes

Composition

Davison and similar soils: 75 to 90 percent

Contrasting inclusions: 10 to 25 percent

Setting

Landform: Till plains

Landform position: Footslopes

Slope range: 0 to 2 percent

Shape of areas: Irregular

Size of areas: 5 to 50 acres

Typical Profile

Surface layer:

0 to 8 inches - dark gray, calcareous loam

Subsoil:

8 to 28 inches - pale yellow, calcareous loam

Underlying layer:

28 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Somewhat poorly drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: 1.5 to 4 feet

Flooding: None

Ponding: None

Permeability: Moderately slow

Available water capacity: High

Organic matter content: Moderate

Surface runoff: Low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Bonilla and Prosper soils which are not calcareous at or near the surface and are dark to a depth greater than 20 inches on footslopes

Poorly drained Tetonka soils in basins

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Wind erosion, high content of lime adversely affects the availability of plant nutrients

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control wind erosion and conserve moisture.

Rotations including grasses and legumes help to control wind erosion and maintain organic matter content and tilth.

Interpretive Groups

Land capability classification: IIe

Ecological site: Limy Subirrigated

Conservation tree and shrub group: 1KK

Forage suitability group: Subirrigated

Dd—Davison-Tetonka complex, 0 to 2 percent slopes

Composition

Davison and similar soils: 45 to 60 percent

Tetonka and similar soils: 30 to 45 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Davison - footslopes; Tetonka - basins

Slope range: Davison - 0 to 2 percent; Tetonka - 0 to 1 percent

Shape of areas: Long and narrow

Size of areas: 10 to 50 acres

Typical Profile

Davison

Surface layer:

0 to 8 inches - dark gray, calcareous loam

Subsoil:

8 to 28 inches - pale yellow, calcareous loam

Underlying layer:

28 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Tetonka

Surface layer:

0 to 8 inches - grayish brown silt loam

Subsurface layer:

8 to 13 inches - light gray, silt loam with redox concentrations

Subsoil:

13 to 25 inches - dark gray silty clay

25 to 39 inches - gray silty clay

39 to 47 inches - grayish brown, calcareous clay loam, with redox concentrations and depletions

47 to 62 inches - light olive gray, calcareous clay loam with redox concentrations and depletions

Underlying layer:

62 to 80 inches - pale olive, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Davison - somewhat poorly drained; Tetonka - poorly drained

Depth to restrictive feature: Davison - none; Tetonka - none

Depth to contrasting parent material: Davison - greater than 60 inches;
Tetonka - greater than 60 inches

Depth to high water table: Davison - 1.5 to 4 feet; Tetonka - plus 1 to 1 foot

Flooding: Davison - none; Tetonka - none

Ponding: Davison - none; Tetonka - frequent for long periods

Permeability: Davison - moderately slow; Tetonka - slow

Available water capacity: Davison - high; Tetonka - high

Organic matter content: Davison - moderate; Tetonka - high

Surface runoff: Davison - low; Tetonka - negligible

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Bonilla soils which are not calcareous at or near the surface on footslopes

Moderately well drained Prosper soils which are not calcareous at or near the surface and contain less clay in the subsoil than the Bonilla soils on footslopes

Poorly drained Lawet soils on toeslopes

Very poorly drained Worthing soils in the center of the basins

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Davison - wind erosion, high content of lime adversely affects the availability of plant nutrients; Tetonka - ponding, high water table, slow permeability

Management measures:

These soils are better suited to late-planted crops.

Leaving crop residue on the surface and deferring tillage when the soils are wet help to maintain tilth, control wind erosion, and limit compaction.

Rotations including grasses and legumes help to control wind erosion and maintain fertility, organic matter content, and tilth.

Maintain existing drainage systems to remove excess water on the Tetonka soil.

Interpretive Groups

Land capability classification: Davison - IIe; Tetonka - IVw

Ecological site: Davison - Limy Subirrigated; Tetonka - Wet Meadow

Conservation tree and shrub group: Davison - 1KK; Tetonka - 10

Forage suitability group: Davison - Subirrigated; Tetonka - Wet

DeA—Delmont-Enet loams, 0 to 2 percent slopes

Composition

Delmont and similar soils: 45 to 60 percent

Enet and similar soils: 25 to 40 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Outwash plains

Landform position: Delmont - summits and backslopes; Enet - footslopes

Slope range: Delmont - 0 to 2 percent; Enet - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Delmont

Surface layer:

0 to 7 inches - very dark gray loam

Subsoil:

7 to 16 inches - very dark grayish brown loam

16 to 22 inches - grayish brown, calcareous gravelly loamy sand

Underlying layer:

22 to 80 inches - light olive brown, calcareous gravelly loamy sand

Enet

Surface layer:

0 to 7 inches - dark gray loam

Subsoil:

7 to 15 inches - dark grayish brown loam

15 to 28 inches - brown loam

28 to 35 inches - light olive brown, calcareous gravelly loamy sand

Underlying layer:

35 to 80 inches - light olive brown, calcareous very gravelly loamy sand

Soil Properties and Qualities

Drainage class: Delmont - somewhat excessively drained; Enet - well drained

Depth to restrictive feature: Delmont - strongly contrasting textural stratification-top depth ranges from 14 to 20 inches; Enet - strongly contrasting textural stratification-top depth ranges from 20 to 40 inches

Depth to contrasting parent material: Delmont - 14 to 20 inches over gravelly material; Enet - 20 to 40 inches over gravelly material

Depth to high water table: Delmont - greater than 6 feet; Enet - greater than 6 feet

Flooding: Delmont - none; Enet - none

Ponding: Delmont - none; Enet - none

Permeability: Delmont - moderate in the loamy sediments and very rapid in the underlying gravelly material; Enet - moderate in the loamy sediments and very rapid in the underlying gravelly material

Available water capacity: Delmont - low; Enet - moderate

Organic matter content: Delmont - moderate; Enet - moderate

Surface runoff: Delmont - low; Enet - low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Blendon soils which do not have gravelly material within a depth of 40 inches on footslopes

Excessively drained Talmo soils which have gravelly material within a depth of 14 inches on shoulders

Use and Management

Cropland

Main crops: Spring wheat, alfalfa, corn, sunflowers, and soybeans

Suitability for cropland: Fairly well suited

Management concerns:

Delmont - low available water capacity, agrochemical leaching; Enet - moderate available water capacity, agrochemical leaching

Management measures:

These soils are better suited to early-maturing crops such as small grains.

Minimizing tillage and leaving crop residue on the surface help to conserve moisture.

Timing nitrogen applications close to the time crops will use it shortens the time available for leaching. Proper pesticide application is critical.

Interpretive Groups

Land capability classification: Delmont - IVs; Enet - IIIs

Ecological site: Delmont - Shallow Gravel; Enet - Loamy

Conservation tree and shrub group: Delmont - 6G; Enet - 6G

Forage suitability group: Delmont - Very Droughty Loam; Enet - Droughty Loam

Dk—Dimo loam, 0 to 2 percent slopes**Composition**

Dimo and similar soils: 80 to 90 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Outwash plains

Landform position: Footslopes

Slope range: 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile**Surface layer:**

0 to 7 inches - dark gray loam

Subsoil:

7 to 18 inches - dark gray loam

18 to 26 inches - dark grayish brown loam with redox concentrations

26 to 31 inches - grayish brown, calcareous loam with redox concentrations

31 to 43 inches - light yellowish brown, calcareous gravelly loamy sand with redox concentrations redox depletions

Underlying layer:

43 to 61 inches - light brownish gray, calcareous very gravelly loamy sand with redox concentrations and depletions

61 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Moderately well drained

Depth to restrictive feature: Strongly contrasting textural stratification; top depth ranges from 20 to 40 inches

Depth to contrasting parent material: 20 to 40 inches over gravelly material

Depth to high water table: 3 to 5 feet

Flooding: Rare for brief periods

Ponding: None

Permeability: Moderate in the loamy sediments and very rapid in the underlying gravelly material

Available water capacity: Moderate

Organic matter content: High

Surface runoff: Low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Davis soils which are not underlain with gravelly material on high flood plains

Well drained Enet soils which do not have redox concentrations within a depth of 40 inches on footslopes

Poorly drained Grat soils in basins

Moderately well drained Northville soils which are not underlain with gravelly material and have a sodium-affected subsoil on high flood plains

Use and Management

Cropland

Main crops: Spring wheat, alfalfa, corn, sunflowers, and soybeans

Suitability for cropland: Fairly well suited

Management concerns:

Moderate available water capacity, agrochemical leaching

Management measures:

The soil is better suited to early-maturing crops such as small grains, except in years when a high water table is accessible by late-planted crops.

Minimizing tillage and leaving crop residue on the surface help to conserve moisture.

Timing nitrogen applications close to the time crops will use it shortens the time available for leaching. Proper pesticide application is critical.

Interpretive Groups

Land capability classification: IIIs

Ecological site: Loamy Overflow

Conservation tree and shrub group: 2

Forage suitability group: Subirrigated

Dm—Dimo-Grat loams, 0 to 2 percent slopes

Composition

Dimo and similar soils: 45 to 60 percent

Grat and similar soils: 30 to 45 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Outwash plains

Landform position: Dimo - footslopes; Grat - basins

Slope range: Dimo - 0 to 2 percent; Grat - 0 to 1 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Dimo

Surface layer:

0 to 7 inches - dark gray loam

Subsoil:

7 to 18 inches - dark gray loam

18 to 26 inches - dark grayish brown, loam with redox concentrations

26 to 31 inches - grayish brown, calcareous loam with redox concentrations

31 to 43 inches - light yellowish brown, calcareous gravelly loamy sand with redox concentrations and depletions

Underlying layer:

43 to 61 inches - light brownish gray, calcareous very gravelly loamy sand with redox concentrations and depletions

61 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Grat

Surface layer:

0 to 6 inches - dark gray loam

Subsurface layer:

6 to 9 inches - gray clay loam

Subsoil:

9 to 27 inches - dark gray clay loam

Underlying layer:

27 to 57 inches - light brownish gray and light yellowish brown, calcareous gravelly loamy sand with redox concentrations and depletions

57 to 80 inches - light olive gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Dimo - somewhat poorly drained; Grat - poorly drained

Depth to restrictive feature: Dimo - strongly contrasting textural stratification-top depth ranges from 20 to 40 inches; Grat - strongly contrasting textural stratification-top depth ranges from 20 to 40 inches

Depth to contrasting parent material: Dimo - 20 to 40 inches over gravelly material; Grat - 20 to 40 inches over gravelly material

Depth to high water table: Dimo - 1.5 to 3 feet; Grat - plus 1 to 2 feet

Flooding: Dimo - rare for brief periods; Grat - none

Ponding: Dimo - none; Grat - occasional for long periods

Permeability: Dimo - moderate in the loamy sediments and very rapid in the underlying gravelly material; Grat - slow in the solum and rapid in the underlying gravelly material

Available water capacity: Dimo - moderate; Grat - moderate

Organic matter content: Dimo - high; Grat - high

Surface runoff: Dimo - low; Grat - negligible

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Enet soils which do not have redox concentrations within a depth of 40 inches on footslopes

Poorly drained Tetonka soils which do not have gravelly material within a depth of 40 inches in basins

Use and Management

Cropland

Main crops: Corn, soybeans, sunflowers, and spring wheat

Suitability for cropland: Fairly well suited

Management concerns:

Dimo - flooding, high water table, moderate available water capacity, agrochemical leaching; Grat - ponding, high water table, agrochemical leaching

Management measures:

In wet years the Dimo and Grat soils are better suited to late-planted crops.

Deferring tillage when the soil is wet helps to limit compaction.

Timing nitrogen application close to the time crops will use it shortens the time available for leaching. Proper pesticide application is critical.

Interpretive Groups

Land capability classification: Dimo - IIw; Grat - IVw

Ecological site: Dimo - Loamy Overflow; Grat - Wet Meadow

Conservation tree and shrub group: Dimo - 2; Grat - 10

Forage suitability group: Dimo - Subirrigated; Grat - Wet

DoA—Doland-Embden complex, 0 to 3 percent slopes

Composition

Doland and similar soils: 45 to 60 percent

Embden and similar soils: 30 to 45 percent

Contrasting inclusions: 15 to 25 percent

Setting

Landform: Till plains and outwash plains

Landform position: Doland - summits and backslopes; Embden - footslopes

Slope range: Doland - 0 to 3 percent; Embden - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Doland

Surface layer:

0 to 7 inches - dark gray loam

Subsoil:

7 to 15 inches - grayish brown loam

15 to 28 inches - brown loam

28 to 52 inches - light yellowish brown, calcareous clay loam with relict redox features in the lower part

Underlying layer:

52 to 80 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

Embden**Surface layer:**

0 to 15 inches - dark gray fine sandy loam

Subsoil:

15 to 20 inches - gray fine sandy loam

20 to 27 inches - grayish brown fine sandy loam

27 to 38 inches - light olive brown sandy loam

38 to 52 inches - light brownish gray, calcareous loamy sand

Underlying layer:

52 to 80 inches - light gray, calcareous sand

Soil Properties and Qualities

Drainage class: Doland - well drained; Embden - moderately well drained

Depth to restrictive feature: Doland - none; Embden - none

Depth to contrasting parent material: Doland - 15 to 30 inches over glacial till;
Embden - greater than 60 inches

Depth to high water table: Doland - 4 to 6 feet; Embden - 3 to 5 feet

Flooding: Doland - none; Embden - none

Ponding: Doland - none; Embden - none

Permeability: Doland - moderately slow; Embden - moderately rapid

Available water capacity: Doland - high; Embden - moderate

Organic matter content: Doland - moderate; Embden - high

Surface runoff: Doland - low; Embden - low

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Well drained Eckman soils which have varves within a depth of 40 inches

Well drained Egeland soils which are dark to a depth less than 16 inches and do not have glacial till within a depth of 40 inches on backslopes

Well drained Fordville soils which have gravelly material at a depth of 20 to 40 inches on footslopes

Similar inclusions:

Soils that have more silt and less sand in the surface layer than the Doland soil

Soils that have more clay and less sand in the surface layer than the Doland soil

Use and Management**Cropland**

Main crops: Spring wheat, alfalfa, corn, soybeans, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Doland - few limitations except to conserve moisture; Embden - wind erosion, moderate available water capacity, agrochemical leaching

Management measures:

Minimizing tillage and leaving crop residue on the surface help to conserve moisture and control wind erosion.

Wind stripcropping and field windbreaks also help to control wind erosion.

Timing nitrogen application close to the time crops will use it shortens the time available for leaching. Proper pesticide application is critical.

Interpretive Groups

Land capability classification: Doland - IIc; Embden - IIIe

Ecological site: Doland - Loamy; Embden - Sandy

Conservation tree and shrub group: Doland - 3; Embden - 1

Forage suitability group: Doland - Loam; Embden - Loam

Dq—Dovecreek silt loam, 0 to 2 percent slopes

Composition

Dovecreek and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Flood plains

Landform position: Low flood plains

Slope range: 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Surface layer:

0 to 8 inches - dark grayish brown silt loam

Subsurface layer:

8 to 16 inches - dark gray silt loam

Subsoil:

16 to 22 inches - gray silty clay loam

22 to 30 inches - grayish brown, calcareous silty clay loam

30 to 37 inches - brown, calcareous silt loam

37 to 46 inches - pale brown, calcareous silt loam

Underlying layer:

46 to 80 inches - brown, calcareous silt loam with redox depletions

Soil Properties and Qualities

Drainage class: Moderately well drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: 3.5 to 5 feet

Flooding: Rare for brief periods

Ponding: None

Permeability: Moderate

Available water capacity: High

Organic matter content: High

Surface runoff: Low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Somewhat poorly drained Lamoure soils which are calcareous to the surface on low flood plains

Somewhat poorly drained Ranslo soils which have a sodium-affected subsoil on low flood plains

Similar inclusions:

Soils that have more sand and less silt

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Well suited

Management concerns:

Few limitations except to conserve moisture

Management measures:

Managing tillage and leaving crop residue conserves moisture and helps to maintain organic matter content and tilth.

Interpretive Groups

Land capability classification: IIc

Ecological site: Loamy Overflow

Conservation tree and shrub group: 1

Forage suitability group: Overflow

Dr—Dovray silty clay, 0 to 1 percent slopes

Composition

Dovray and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Basins

Slope range: 0 to 1 percent

Shape of areas: Long and narrow

Size of areas: 5 to 75 acres

Typical Profile

Surface layer:

0 to 16 inches - dark gray silty clay

Subsoil:

16 to 24 inches - gray silty clay

24 to 33 inches - gray, calcareous silty clay

33 to 40 inches - light gray, calcareous silty clay with redox concentrations

Underlying layer:

40 to 60 inches - light gray, calcareous silty clay loam with redox concentrations

Soil Properties and Qualities

Drainage class: Very poorly drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: Plus 2 to 0.5 feet

Flooding: None

Ponding: Frequent for very long periods

Permeability: Slow

Available water capacity: High

Organic matter content: High

Surface runoff: Negligible

Inclusions

Contrasting inclusions: (May have significant management concerns)

- Somewhat poorly drained Bearden soils which are calcareous at or near the surface on footslopes
- Poorly drained Colvin soils which are calcareous at or near the surface on toeslopes
- Poorly drained Tonka soils which have less clay in the surface and subsurface layers than the Dovray soils in basins

Use and Management

Rangeland

- Main crops: Unsited
- Suitability for cropland: Generally unsited

Management concerns:

- Ponding, high water table, high water table, surface compaction

Management measures:

- Proper grazing management helps to maintain plant vigor.
- Restricting grazing during wet periods helps to limit compaction.

Interpretive Groups

Land capability classification: Vw

Ecological site: Shallow Marsh

Conservation tree and shrub group: 10

Forage suitability group: Wet

Du—Dudley-Jerauld silt loams, 0 to 2 percent slopes

Composition

- Dudley and similar soils: 50 to 60 percent
- Jerauld and similar soils: 30 to 40 percent
- Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Dudley - summits and backslopes; Jerauld - footslopes

Slope range: Dudley - 0 to 2 percent; Jerauld - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 25 to 200 acres

Typical Profile

Dudley

Surface layer:

- 0 to 5 inches - dark gray silt loam

Subsurface layer:

- 5 to 7 inches - gray silt loam

Subsoil:

- 7 to 18 inches - dark gray clay loam
- 18 to 25 inches - dark grayish brown, calcareous clay loam with masses of salt
- 25 to 39 inches - grayish brown, calcareous clay loam with masses of salt, nests of gypsum, and redox concentrations

Underlying layer

39 to 62 inches - grayish brown, calcareous clay loam with redox concentrations and depletions

62 to 80 inches - light gray, calcareous clay loam with redox concentrations and depletions

Jerauld**Surface layer:**

0 to 2 inches - gray silt loam

Subsoil:

2 to 14 inches - dark gray clay loam

14 to 33 inches - grayish brown, calcareous clay loam with masses of salt and nests of gypsum

33 to 41 inches - light brownish gray, calcareous clay loam with masses of salt, nests of gypsum, and redox concentrations and depletions

Underlying layer:

41 to 61 inches - grayish brown, calcareous clay loam with redox concentrations and depletions

61 to 80 inches - gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Dudley - moderately well drained; Jerauld - moderately well drained

Depth to restrictive feature: Dudley - natric-top depth ranges from 7 to 17 inches; Jerauld - natric-top depth ranges from 1 to 5 inches

Depth to contrasting parent material: Dudley - greater than 60 inches; Jerauld - greater than 60 inches

Depth to high water table: Dudley - 3.5 to 5 feet; Jerauld - 3.5 to 5 feet

Flooding: Dudley - none; Jerauld - none

Ponding: Dudley - none; Jerauld - none

Permeability: Dudley - very slow; Jerauld - very slow

Available water capacity: Dudley - moderate; Jerauld - moderate

Organic matter content: Dudley - moderate; Jerauld - moderately low

Surface runoff: Dudley - low; Jerauld - low

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Well drained Beadle soils which do not have a sodium-affected subsoil on backslopes

Well drained Houdek soils which do not have a sodium-affected subsoil and contain less clay in the subsoil than the Beadle soils on backslopes

Poorly drained Hoven soils in basins

Moderately well drained Stickney soils which have a lesser sodium-affected subsoil than the Dudley soil on footslopes

Use and Management**Cropland or pasture**

Main crops: Dudley - spring wheat, barley, sunflowers, and alfalfa;

Jerauld - unsuited

Suitability for cropland: Generally unsuited

Management concerns:

Sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.

Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Dudley - IVs; Jerauld - VIs

Ecological site: Dudley - Claypan; Jerauld - Thin Claypan

Conservation tree and shrub group: Dudley - 9C; Jerauld - 10

Forage suitability group: Dudley - Claypan; Jerauld - Not Suited

Dx—Durrstein silt loam, 0 to 1 percent slopes**Composition**

Durrstein and similar soils: 80 to 90 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Flood plains

Landform position: Low flood plains

Slope range: 0 to 1 percent

Shape of areas: Long and narrow

Size of areas: 10 to 100 acres

Typical Profile**Surface layer:**

0 to 2 inches - gray silt loam

Subsoil:

2 to 14 inches - dark gray silty clay

14 to 32 inches - gray, calcareous silty clay with masses of salt, crystals of gypsum, and redox concentrations in the lower part

32 to 43 inches - gray, calcareous silty clay with masses of salt, crystals of gypsum, and redox concentrations

Underlying layer:

43 to 48 inches - black, calcareous silt clay loam

48 to 80 inches - gray, calcareous silty clay loam with redox concentrations

Soil Properties and Qualities

Drainage class: Poorly drained

Depth to restrictive feature: Natric; top depth ranges from 0 to 2 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: 0 to 1.5 feet

Flooding: Frequent for brief periods

Ponding: None

Permeability: Very slow

Available water capacity: Moderate

Organic matter content: Moderately low

Surface runoff: Very low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Somewhat poorly drained Farmsworth and moderately well drained Northville soils, which do not have visible salts within a depth of 15 inches on high flood plains

Use and Management

Rangeland

Main crops: Unsited

Suitability for cropland: Unsited

Management concerns:

Flooding, high water table, sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability

Management measures:

Proper grazing management helps to maintain plant vigor.

Seed cultivated areas to adapted grasses.

Interpretive Groups

Land capability classification: VIs

Ecological site: Saline Lowland

Conservation tree and shrub group: 10

Forage suitability group: Not Suited

Ea—Eckman very fine sandy loam, 0 to 2 percent slopes

Composition

Eckman and similar soils: 80 to 90 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Lake plains

Landform position: Backslopes

Slope range: 0 to 2 percent

Shape of areas: Irregular

Size of areas: 20 to 100 acres

Typical Profile

Surface layer:

0 to 7 inches - dark gray very fine sandy loam

Subsoil:

7 to 12 inches - dark grayish brown very fine sandy loam

12 to 17 inches - grayish brown very fine sandy loam

17 to 39 inches - light yellowish brown, calcareous very fine sandy loam

Underlying layer:

39 to 80 inches - pale yellow, calcareous very fine sandy loam

Soil Properties and Qualities

Drainage class: Well drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: Greater than 6 feet

Flooding: None

Ponding: None
Permeability: Moderate
Available water capacity: High
Organic matter content: Moderate
Surface runoff: Low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Gardena soils which are dark to a depth greater than 16 inches on footslopes
Well drained Zell soils which are calcareous to the surface on shoulders

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers
Suitability for cropland: Well suited

Management concerns:

Wind erosion

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control wind erosion and conserve moisture.
Wind stripcropping and field windbreaks also help to control wind erosion.

Interpretive Groups

Land capability classification: IIe

Ecological site: Loamy

Conservation tree and shrub group: 3

Forage suitability group: Loam

EcA—Eckman-Gardena very fine sandy loams, 0 to 2 percent slopes

Composition

Eckman and similar soils: 45 to 60 percent
Gardena and similar soils: 35 to 45 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Eckman - summits and backslopes; Gardena - footslopes

Slope range: Eckman - 0 to 2 percent; Gardena - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Eckman

Surface layer:

0 to 7 inches - dark gray very fine sandy loam

Subsoil:

7 to 12 inches - dark grayish brown very fine sandy loam

12 to 17 inches - grayish brown very fine sandy loam

17 to 39 inches - light yellowish brown, calcareous very fine sandy loam

Underlying layer:

39 to 80 inches - pale yellow, calcareous very fine sandy loam

Gardena

Surface layer:

0 to 9 inches - dark gray very fine sandy loam

Subsurface layer:

9 to 20 inches - dark grayish brown very fine sandy loam

Subsoil:

20 to 28 inches - dark grayish brown very fine sandy loam

28 to 36 inches - brown very fine sandy loam

36 to 51 inches - pale yellow, calcareous very fine sandy loam

Underlying layer:

51 to 80 inches - pale yellow, calcareous loamy very fine sand

Soil Properties and Qualities

Drainage class: Eckman - well drained; Gardena - moderately well drained

Depth to restrictive feature: Eckman - none; Gardena - none

Depth to contrasting parent material: Eckman - greater than 60 inches;

Gardena - greater than 60 inches

Depth to high water table: Eckman - greater than 6 feet; Gardena - 3 to 5 feet

Flooding: Eckman - none; Gardena - none

Ponding: Eckman - none; Gardena - none

Permeability: Eckman - moderate; Gardena - moderate

Available water capacity: Eckman - high; Gardena - high

Organic matter content: Eckman - moderate; Gardena - high

Surface runoff: Eckman - low; Gardena - low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Camtown soils which have a sodium-affected subsoil on footslopes

Well drained Zell soils which are calcareous to the surface on shoulders

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Well suited

Management concerns:

Wind erosion

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control wind erosion and conserve moisture.

Wind stripcropping and field windbreaks also help to control wind erosion.

Interpretive Groups

Land capability classification: Eckman - IIe; Gardena - IIe

Ecological site: Eckman - Loamy; Gardena - Loamy

Conservation tree and shrub group: Eckman - 3; Gardena - 1

Forage suitability group: Eckman - Loam; Gardena - Overflow

EcB—Eckman-Gardena very fine sandy loams, 2 to 6 percent slopes

Composition

Eckman and similar soils: 50 to 65 percent

Gardena and similar soils: 25 to 40 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Eckman - summits and backslopes; Gardena - footslopes

Slope range: Eckman - 2 to 6 percent; Gardena - 2 to 3 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Eckman

Surface layer:

0 to 7 inches - dark gray very fine sandy loam

Subsoil:

7 to 12 inches - dark grayish brown very fine sandy loam

12 to 17 inches - grayish brown very fine sandy loam

17 to 39 inches - light yellowish brown, calcareous very fine sandy loam

Underlying layer:

39 to 80 inches - pale yellow, calcareous very fine sandy loam

Gardena

Surface layer:

0 to 9 inches - dark gray very fine sandy loam

Subsurface layer:

9 to 20 inches - dark grayish brown very fine sandy loam

Subsoil:

20 to 28 inches - dark grayish brown very fine sandy loam

28 to 36 inches - brown very fine sandy loam

36 to 51 inches - pale yellow, calcareous very fine sandy loam

Underlying layer:

51 to 80 inches - pale yellow, calcareous loamy very fine sand

Soil Properties and Qualities

Drainage class: Eckman - well drained; Gardena - moderately well drained

Depth to restrictive feature: Eckman - none; Gardena - none

Depth to contrasting parent material: Eckman - greater than 60 inches;

Gardena - greater than 60 inches

Depth to high water table: Eckman - greater than 6 feet; Gardena - 3 to 5 feet

Flooding: Eckman - none; Gardena - none

Ponding: Eckman - none; Gardena - none

Permeability: Eckman - moderate; Gardena - moderate

Available water capacity: Eckman - high; Gardena - high

Organic matter content: Eckman - moderate; Gardena - high

Surface runoff: Eckman - medium; Gardena - low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Zell soils which are calcareous to the surface on shoulders

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Well suited

Management concerns:

Wind and water erosion

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control erosion and conserve moisture.

Contour farming and grassed waterways also help to control water erosion, but slopes in some areas are too short or too irregular for contouring.

Wind stripcropping and field windbreaks also help to control wind erosion.

Interpretive Groups

Land capability classification: Eckman - IIe; Gardena - IIe

Ecological site: Eckman - Loamy; Gardena - Loamy

Conservation tree and shrub group: Eckman - 3; Gardena - 1

Forage suitability group: Eckman - Loam; Gardena - Overflow

EdB—Eckman-Zell very fine sandy loams, 2 to 6 percent slopes

Composition

Eckman and similar soils: 55 to 65 percent

Zell and similar soils: 25 to 35 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Eckman - backslopes; Zell - shoulders

Slope range: Eckman - 2 to 6 percent; Zell - 2 to 6 percent

Shape of areas: Irregular

Size of areas: 5 to 50 acres

Typical Profile

Eckman

Surface layer:

0 to 7 inches - dark gray very fine sandy loam

Subsoil:

7 to 12 inches - dark grayish brown very fine sandy loam

12 to 17 inches - grayish brown very fine sandy loam

17 to 39 inches - light yellowish brown, calcareous very fine sandy loam

Underlying layer:

39 to 80 inches - pale yellow, calcareous very fine sandy loam

Zell**Surface layer:**

0 to 7 inches - dark grayish brown, calcareous very fine sandy loam

Subsoil:

7 to 31 inches - pale yellow, calcareous very fine sandy loam

Underlying layer:

31 to 80 inches - pale yellow, calcareous very fine sandy loam

Soil Properties and Qualities

Drainage class: Eckman - well drained; Zell - well drained

Depth to restrictive feature: Eckman - none; Zell - none

Depth to contrasting parent material: Eckman - greater than 60 inches;
Zell - greater than 60 inches

Depth to high water table: Eckman - greater than 6 feet; Zell - greater than 6 feet

Flooding: Eckman - none; Zell - none

Ponding: Eckman - none; Zell - none

Permeability: Eckman - moderate; Zell - moderate

Available water capacity: Eckman - high; Zell - high

Organic matter content: Eckman - moderate; Zell - moderately low

Surface runoff: Eckman - medium; Zell - medium

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Moderately well drained Gardena soils which are dark to a depth greater than 16 inches on footslopes

Use and Management**Cropland**

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Eckman - water and wind erosion; Zell - water and wind erosion, high content of lime adversely affects the availability of plant nutrients

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to control erosion, conserve moisture, and maintain organic matter content and tilth.

Contour farming and grassed waterways also help to control water erosion, but slopes in some areas are too short or too irregular for contouring.

Wind stripcropping and field windbreaks also help to control wind erosion.

Applying animal waste, especially on the Zell soil, helps to maintain fertility.

Interpretive Groups

Land capability classification: Eckman - IIe; Zell - IIIe

Ecological site: Eckman - Loamy; Zell - Thin Loamy

Conservation tree and shrub group: Eckman - 3; Zell - 8K

Forage suitability group: Eckman - Loam; Zell - Limy Upland

EeB—Edgeley loam, 2 to 6 percent slopes**Composition**

Edgeley and similar soils: 80 to 90 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Moraines

Landform position: Shoulders and backslopes

Slope range: 2 to 6 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile**Surface layer:**

0 to 8 inches - dark gray loam

Subsoil:

8 to 18 inches - brown loam

18 to 25 inches - light olive brown, calcareous clay loam

Underlying layer:

25 to 80 inches - gray, calcareous weathered shale bedrock

Soil Properties and Qualities

Drainage class: Well drained

Depth to restrictive feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches

Depth to contrasting parent material: 20 to 40 inches over shale bedrock

Depth to high water table: Greater than 6 feet

Flooding: None

Ponding: None

Permeability: Moderate in the loamy sediments and very slow in underlying soft shale bedrock

Available water capacity: Moderate

Organic matter content: Moderate

Surface runoff: Medium

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Moderately well drained Aastad soils which are dark to a depth greater than 16 inches on footslopes

Well drained Buse soils which are calcareous to the surface on shoulders

Similar inclusions:

Soils that do not have shale bedrock within a depth of 40 inches

Use and Management**Cropland**

Main crops: Spring wheat, alfalfa, corn, soybeans, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Water erosion, moderate available water capacity

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control water erosion and conserve moisture.

Contour farming and grassed waterways also help to control water erosion, but slopes in some areas are too short or too irregular for contouring.

The soil is better suited to early-maturing crops, such as small grains.

Interpretive Groups

Land capability classification: IIe

Ecological site: Loamy

Conservation tree and shrub group: 6D

Forage suitability group: Droughty Loam

EeC—Edgeley loam, 6 to 9 percent slopes**Composition**

Edgeley and similar soils: 80 to 90 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Moraines

Landform position: Shoulders and backslopes

Slope range: 6 to 9 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile**Surface layer:**

0 to 8 inches - dark gray loam

Subsoil:

8 to 18 inches - brown loam

18 to 25 inches - light olive brown, calcareous clay loam

Underlying layer:

25 to 80 inches - gray, calcareous weathered shale bedrock

Soil Properties and Qualities

Drainage class: Well drained

Depth to restrictive feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches

Depth to contrasting parent material: 20 to 40 inches over shale bedrock

Depth to high water table: Greater than 6 feet

Flooding: None

Ponding: None

Permeability: Moderate in the loamy sediments and very slow in underlying soft shale bedrock

Available water capacity: Moderate

Organic matter content: Moderate

Surface runoff: High

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Aastad soils which are dark to a depth greater than 16 inches on footslopes

Well drained Buse soils which are calcareous to the surface on shoulders

Similar inclusions:

Soils that do not have shale bedrock within a depth of 40 inches

Soils that have shale bedrock within a depth of 20 inches

Use and Management

Cropland

Main crops: Spring wheat, alfalfa, corn, soybeans, and sunflowers

Suitability for cropland: Poorly suited

Management concerns:

Water erosion, moderate available water capacity

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control water erosion and conserve moisture.

Contour farming, terraces, and grassed waterways also help to control water erosion, but slopes in some areas are too short or too irregular for contouring or terracing.

The soil is better suited to early maturing crops such as small grains.

Interpretive Groups

Land capability classification: IIIe

Ecological site: Loamy

Conservation tree and shrub group: 6D

Forage suitability group: Droughty Loam

EeD—Edgeley loam, 9 to 20 percent slopes

Composition

Edgeley and similar soils: 80 to 90 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Moraines

Landform position: Shoulders and backslopes

Slope range: 9 to 20 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Surface layer:

0 to 8 inches - dark gray loam

Subsoil:

8 to 18 inches - brown loam

18 to 25 inches - light olive brown, calcareous clay loam

Underlying layer:

25 to 80 inches - gray, calcareous weathered shale bedrock

Soil Properties and Qualities

Drainage class: Well drained

Depth to restrictive feature: Bedrock (paralithic); top depth ranges from 20 to 40 inches

Depth to contrasting parent material: 20 to 40 inches over shale bedrock

Depth to high water table: Greater than 6 feet

Flooding: None

Ponding: None

Permeability: Moderate in the loamy sediments and very slow in underlying soft shale bedrock

Available water capacity: Moderate

Organic matter content: Moderate

Surface runoff: High

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Aastad soils which are dark to a depth greater than 16 inches on footslopes

Well drained Buse soils which are calcareous to the surface on shoulders

Similar inclusions:

Soils that do not have shale bedrock within a depth of 40 inches

Soils that have shale bedrock within a depth of 20 inches

Use and Management

Rangeland

Main crops: Generally not suited

Suitability for cropland: Generally unsuited

Management concerns:

Water erosion, moderate available water capacity

Management measures:

Proper grazing management helps to maintain plant vigor and control water erosion.

Seed cultivated areas to adapted grasses.

Interpretive Groups

Land capability classification: VIe

Ecological site: Loamy

Conservation tree and shrub group: 10

Forage suitability group: Not Suited

EgA—Egeland-Embden complex, 0 to 2 percent slopes

Composition

Egeland and similar soils: 45 to 55 percent

Embden and similar soils: 35 to 45 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Outwash plains

Landform position: Egeland - summits and backslopes; Embden - footslopes

Slope range: Egeland - 0 to 2 percent; Embden - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 5 to 100 acres

Typical Profile

Egeland

Surface layer:

0 to 8 inches - dark gray sandy loam

Subsoil:

8 to 14 inches - dark grayish brown sandy loam

14 to 31 inches - grayish brown sandy loam

31 to 46 inches - pale brown, calcareous loamy sand

Underlying layer:

46 to 64 inches - brown, calcareous loamy sand

64 to 80 inches - light brownish gray, calcareous sandy loam with redox concentrations

Embden

Surface layer:

0 to 15 inches - dark gray fine sandy loam

Subsoil:

15 to 20 inches - gray fine sandy loam

20 to 27 inches - grayish brown fine sandy loam

27 to 38 inches - light olive brown sandy loam

38 to 52 inches - light brownish gray, calcareous loamy sand

Underlying layer:

52 to 80 inches - light gray, calcareous sand

Soil Properties and Qualities

Drainage class: Egeland - well drained; Embden - moderately well drained

Depth to restrictive feature: Egeland - none; Embden - none

Depth to contrasting parent material: Egeland - greater than 60 inches;
Embden - greater than 60 inches

Depth to high water table: Egeland - greater than 6 feet; Embden - 3 to 5 feet

Flooding: Egeland - none; Embden - none

Ponding: Egeland - none; Embden - none

Permeability: Egeland - moderately rapid; Embden - moderately rapid

Available water capacity: Egeland - moderate; Embden - moderate

Organic matter content: Egeland - moderate; Embden - high

Surface runoff: Egeland - low; Embden - low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Fordville soils which have gravelly material at a depth of 20 to 40 inches on footslopes

Similar inclusions:

Soils that have more sand in the surface layer than the Egeland soil

Use and Management

Cropland

Main crops: Spring wheat, alfalfa, corn, sunflowers, and soybeans

Suitability for cropland: Fairly well suited

Management concerns:

Wind erosion, moderate available water capacity, agrochemical leaching

Management measures:

These soils are better suited to early-maturing crops such as small grains.

Minimizing tillage and leaving crop residue on the surface help to control wind erosion and conserve moisture.

Wind stripcropping and field windbreaks also help to control wind erosion.

Timing nitrogen application close to the time crops will use it shortens the time available for leaching. Proper pesticide application is critical.

Interpretive Groups

Land capability classification: Egeland - IIIe; Embden - IIIe

Ecological site: Egeland - Sandy; Embden - Sandy

Conservation tree and shrub group: Egeland - 5; Embden - 1

Forage suitability group: Egeland - Droughty Loam; Embden - Loam

EgB—Egeland-Embden complex, 2 to 6 percent slopes**Composition**

Egeland and similar soils: 45 to 60 percent

Embden and similar soils: 25 to 40 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Outwash plains

Landform position: Egeland - summits and backslopes; Embden - footslopes

Slope range: Egeland - 2 to 6 percent; Embden - 2 to 6 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile**Egeland****Surface layer:**

0 to 8 inches - dark gray sandy loam

Subsoil:

8 to 14 inches - dark grayish brown sandy loam

14 to 31 inches - grayish brown sandy loam

31 to 46 inches - pale brown, calcareous loamy sand

Underlying layer:

46 to 64 inches - brown, calcareous loamy sand

64 to 80 inches - light brownish gray, calcareous sandy loam with redox concentrations

Embden**Surface layer:**

0 to 15 inches - dark gray fine sandy loam

Subsoil:

15 to 20 inches - gray fine sandy loam

20 to 27 inches - grayish brown fine sandy loam

27 to 38 inches - light olive brown sandy loam

38 to 52 inches - light brownish gray, calcareous loamy sand

Underlying layer:

52 to 80 inches - light gray, calcareous sand

Soil Properties and Qualities

Drainage class: Egeland - well drained; Embden - moderately well drained

Depth to restrictive feature: Egeland - none; Embden - none

Depth to contrasting parent material: Egeland - greater than 60 inches;
Embden - greater than 60 inches

Depth to high water table: Egeland - greater than 6 feet; Embden - 3 to 5 feet

Flooding: Egeland - none; Embden - none

Ponding: Egeland - none; Embden - none

Permeability: Egeland - moderately rapid; Embden - moderately rapid

Available water capacity: Egeland - moderate; Embden - moderate

Organic matter content: Egeland - moderate; Embden - high

Surface runoff: Egeland - medium; Embden - medium

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Well drained Fordville soils which have gravelly material at a depth of 20 to 40 inches on footslopes

Somewhat excessively drained Renshaw soils which have gravelly material at a depth of 14 to 20 inches on backslopes

Similar inclusions:

Soils that have more sand in the surface layer than the Egeland soil

Use and Management**Cropland**

Main crops: Spring wheat, alfalfa, corn, sunflowers, and soybeans

Suitability for cropland: Poorly suited

Management concerns:

Water and wind erosion, moderate available water capacity, agrochemical leaching

Management measures:

These soils are better suited to early-maturing crops such as small grains.

Minimizing tillage and leaving crop residue on the surface help to control erosion and conserve moisture.

Wind stripcropping and field windbreaks also help to control wind erosion.

Timing nitrogen application close to the time crops will use it shortens the time available for leaching. Proper pesticide application is critical.

Interpretive Groups

Land capability classification: Egeland - IIIe; Embden - IIIe

Ecological site: Egeland - Sandy; Embden - Sandy

Conservation tree and shrub group: Egeland - 5; Embden - 1

Forage suitability group: Egeland - Droughty Loam; Embden - Loam

Ek—Elsmere loamy sand, 0 to 2 percent slopes**Composition**

Elsmere and similar soils: 80 to 90 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Outwash plains
Landform position: Footslopes
Slope range: 0 to 2 percent
Shape of areas: Irregular
Size of areas: 10 to 200 acres

Typical Profile

Surface layer:
0 to 14 inches - dark gray loamy sand
Transitional layer:
14 to 24 inches - grayish brown, calcareous loamy sand
Underlying layer:
24 to 75 inches - light gray, calcareous loamy sand with redox concentrations
75 to 80 inches - light brownish gray, calcareous loamy sand with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Depth to restrictive feature: None
Depth to contrasting parent material: Greater than 60 inches
Depth to high water table: 1.5 to 3 feet
Flooding: None
Ponding: None
Permeability: Rapid
Available water capacity: Low
Organic matter content: Moderate
Surface runoff: Very low

Inclusions

Contrasting inclusions: (May have significant management concerns)
Moderately well drained Forestburg soils which have glacial till at a depth of 20 to 40 inches on backslopes
Poorly drained Lawet soils which are calcareous at or near the surface on toeslopes
Poorly drained Toko soils in basins
Similar inclusions:
Soils that have glacial till within a depth of 40 inches

Use and Management

Cropland
Main crops: Corn, soybeans, and sunflowers
Suitability for cropland: Fairly well suited
Management concerns:
Wind erosion
Management measures:
Minimizing tillage and leaving crop residue on the surface help to control wind erosion.
Wind stripcropping and field windbreaks also help to control wind erosion.

Interpretive Groups

Land capability classification: IVe
Ecological site: Subirrigated

Conservation tree and shrub group: 2

Forage suitability group: Subirrigated

EmE—Ethan-Betts loams, 15 to 40 percent slopes

Composition

Ethan and similar soils: 45 to 55 percent

Betts and similar soils: 30 to 45 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Moraines

Landform position: Ethan - shoulders and backslopes; Betts - shoulders

Slope range: Ethan - 15 to 40 percent; Betts - 25 to 40 percent

Shape of areas: Irregular

Size of areas: 10 to 50 acres

Typical Profile

Ethan

Surface layer:

0 to 8 inches - grayish brown, calcareous loam

Subsoil:

8 to 20 inches - light yellowish brown, calcareous clay loam

20 to 35 inches - pale yellow, calcareous clay loam

Underlying layer:

35 to 68 inches - light yellowish brown, calcareous clay loam with relict redox features

68 to 80 inches - pale yellow, calcareous clay loam with relict redox features

Betts

Surface layer:

0 to 3 inches - grayish brown, calcareous loam

Subsoil:

3 to 10 inches - light gray, calcareous loam

10 to 29 inches - pale yellow, calcareous loam

Underlying layer:

29 to 43 inches - pale yellow, calcareous loam

43 to 80 inches - light yellowish brown, with relict redox features, calcareous loam

Soil Properties and Qualities

Drainage class: Ethan - well drained; Betts - well drained

Depth to restrictive feature: Ethan - none; Betts - none

Depth to contrasting parent material: Ethan - greater than 60 inches;

Betts - greater than 60 inches

Depth to high water table: Ethan - greater than 6 feet; Betts - greater than 6 feet

Flooding: Ethan - none; Betts - none

Ponding: Ethan - none; Betts - none

Permeability: Ethan - moderately slow; Betts - moderately slow

Available water capacity: Ethan - high; Betts - high

Organic matter content: Ethan - moderately low; Betts - low

Surface runoff: Ethan - very high; Betts - very high

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Bonilla soils which are dark to a depth greater than 20 inches on footslopes

Well drained Hand soils which are dark to a depth greater than 7 inches on backslopes

Excessively drained Talmo soils which have gravelly material within a depth of 14 inches on shoulders

Use and Management

Rangeland

Main crops: Unsited

Suitability for cropland: Unsited

Management concerns:

Water and wind erosion, high content of lime adversely affects the availability of plant nutrients

Management measures:

Proper grazing management helps to maintain plant vigor and control erosion.

Interpretive Groups

Land capability classification: Ethan - VIIe; Betts - VIIe

Ecological site: Ethan - Thin Upland; Betts - Thin Upland

Conservation tree and shrub group: Ethan - 10; Betts - 10

Forage suitability group: Ethan - Not Suited; Betts - Not Suited

EnD—Ethan-Hand loams, 9 to 20 percent slopes

Composition

Ethan and similar soils: 45 to 60 percent

Hand and similar soils: 25 to 40 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Moraines

Landform position: Ethan - shoulders; Hand - backslopes

Slope range: Ethan - 9 to 20 percent; Hand - 9 to 15 percent

Shape of areas: Irregular

Size of areas: 10 to 50 acres

Typical Profile

Ethan

Surface layer:

0 to 8 inches - grayish brown, calcareous loam

Subsoil:

8 to 20 inches - light yellowish brown, calcareous clay loam

20 to 35 inches - pale yellow, calcareous clay loam

Underlying layer:

35 to 68 inches - light yellowish brown, calcareous clay loam with relict redox features

68 to 80 inches - pale yellow, calcareous clay loam with relict redox features

Hand**Surface layer:**

0 to 7 inches - dark gray loam

Subsoil:

7 to 18 inches - grayish brown loam

18 to 35 inches - pale yellow, calcareous loam

Underlying layer:

35 to 52 inches - light yellowish, calcareous loam with relict redox features

52 to 80 inches - light yellowish brown and pale yellow, calcareous loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Ethan - well drained; Hand - well drained

Depth to restrictive feature: Ethan - none; Hand - none

Depth to contrasting parent material: Ethan - greater than 60 inches;
Hand - greater than 60 inches

Depth to high water table: Ethan - greater than 6 feet; Hand - 4 to 6 feet

Flooding: Ethan - none; Hand - none

Ponding: Ethan - none; Hand - none

Permeability: Ethan - moderately slow; Hand - moderate

Available water capacity: Ethan - high; Hand - high

Organic matter content: Ethan - moderately low; Hand - moderate

Surface runoff: Ethan - high; Hand - high

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Moderately well drained Bonilla soils which are dark to a depth greater than 20 inches on footslopes

Similar inclusions:

Soils that have a thinner surface layer than the Ethan soil

Soils that have more clay in the subsoil than the Hand soil

Use and Management**Cropland or pasture**

Main crops: Ethan - generally not suited, Hand - spring wheat and alfalfa

Suitability for cropland: Generally unsuited

Management concerns:

Ethan - water and wind erosion, high content of lime adversely affects the availability of plant nutrients; Hand - water erosion

Management measures:

Proper grazing management helps to maintain plant vigor and control erosion.

Seed cultivated areas to adapted grasses.

Interpretive Groups

Land capability classification: Ethan - VIe; Hand - IVe

Ecological site: Ethan - Thin Upland; Hand - Loamy

Conservation tree and shrub group: Ethan - 10; Hand - 3

Forage suitability group: Ethan - Limy Upland; Hand - Loam

Er—Exline-Aberdeen-Nahon silt loams, 0 to 2 percent slopes

Composition

Exline and similar soils: 40 to 55 percent
Aberdeen and similar soils: 25 to 35 percent
Nahon and similar soils: 15 to 25 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Exline - lower footslopes; Aberdeen - summits and backslopes;
Nahon - footslopes

Slope range: Exline - 0 to 2 percent; Aberdeen - 0 to 2 percent; Nahon - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Exline

Surface layer:

0 to 2 inches - gray silt loam

Subsoil:

2 to 12 inches - dark gray silty clay

12 to 21 inches - grayish brown silty clay with masses of salt and nests of gypsum

21 to 40 inches - light brownish gray, calcareous silty clay loam with masses of salt and nests of gypsum in the upper part

Underlying layer:

40 to 56 inches - light gray, calcareous, varved silt loam with redox concentrations and depletions

56 to 80 inches - pale yellow, calcareous, varved silt loam with redox concentrations and depletions

Aberdeen

Surface layer:

0 to 8 inches - dark gray silt loam

Transitional layer:

8 to 13 inches - gray silty clay loam

Subsoil:

13 to 23 inches - dark gray silty clay

23 to 31 inches - grayish brown, calcareous silty clay loam with masses of salt and crystals of gypsum

31 to 39 inches - light brownish gray, calcareous silty clay loam with masses of salt and crystals of gypsum

Underlying layer:

39 to 80 inches - pale yellow, varved calcareous silty clay loam with redox concentrations and depletions

Nahon**Surface layer:**

0 to 7 inches - dark gray silt loam

Subsurface layer:

7 to 9 inches - gray silt loam

Subsoil:

9 to 24 inches - dark grayish brown silty clay

24 to 36 inches - light yellowish brown, calcareous silty clay loam with masses of salt and crystals of gypsum

Underlying layer:

36 to 46 inches - light gray, calcareous, varved silty clay loam with redox depletions

46 to 80 inches - pale yellow, calcareous, varved silty clay loam with redox depletions

Soil Properties and Qualities

Drainage class: Exline - somewhat poorly drained; Aberdeen - moderately well drained; Nahon - moderately well drained

Depth to restrictive feature: Exline - natric-top depth ranges from 0 to 6 inches; Aberdeen - none; Nahon - natric-top depth ranges from 6 to 17 inches

Depth to contrasting parent material: Exline - greater than 60 inches; Aberdeen - greater than 60 inches; Nahon - greater than 60 inches

Depth to high water table: Exline - 1.5 to 3.5 feet; Aberdeen - 3.5 to 5 feet; Nahon - 3.5 to 5 feet

Flooding: Exline - none; Aberdeen - none; Nahon - none

Ponding: Exline - none; Aberdeen - none; Nahon - none

Permeability: Exline - very slow; Aberdeen - slow; Nahon - very slow

Available water capacity: Exline - moderate; Aberdeen - high; Nahon - moderate

Organic matter content: Exline - moderately low; Aberdeen - moderate; Nahon - moderate

Surface runoff: Exline - low; Aberdeen - low; Nahon - low

Inclusions**Contrasting inclusions:**

Moderately well drained Harmony soils which do not have a sodium-affected subsoil on lower backslopes

Poorly drained Heil soils in basins

Use and Management**Cropland or pasture**

Main crops: Exline - unsuited; Aberdeen and Nahon - barley, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Generally unsuited

Management concerns:

Exline and Nahon - sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability;

Aberdeen - slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.

Seed cultivated areas to adapted grasses

Interpretive Groups

Land capability classification: Exline - VIs; Aberdeen - IIIs; Nahon - IVs

Ecological site: Exline - Thin Claypan; Aberdeen - Clayey; Nahon - Claypan

Conservation tree and shrub group: Exline - 10; Aberdeen - 4; Nahon - 9C

Forage suitability group: Exline - Not Suited; Aberdeen - Clayey Subsoil;
Nahon - Claypan

Et—Exline-Aberdeen-Nahon silt loams, till substratum, 0 to 2 percent slopes

Composition

Exline and similar soils: 40 to 55 percent

Aberdeen and similar soils: 25 to 35 percent

Nahon and similar soils: 15 to 25 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Exline - lower footslopes; Aberdeen - summits and backslopes;
Nahon - footslopes

Slope range: Exline - 0 to 2 percent; Aberdeen - 0 to 2 percent; Nahon - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Exline

Surface layer:

0 to 2 inches - gray silt loam

Subsoil:

2 to 14 inches - dark gray silty clay

14 to 24 inches - grayish brown silty clay with masses of salt and nests of gypsum

24 to 39 inches - light gray, calcareous silty clay loam with masses of salt and nests of gypsum in the upper part

Underlying layer:

39 to 55 inches - pale yellow, calcareous, varved silty clay loam and silt loam with redox concentrations and depletions,

55 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Aberdeen

Surface layer:

0 to 6 inches - dark gray silt loam

Transitional layer:

6 to 11 inches - gray silty clay loam

Subsoil:

11 to 17 inches - dark gray silty clay

17 to 23 inches - grayish brown silty clay

23 to 36 inches - light gray, calcareous silty clay loam

Underlying layer:

- 36 to 49 inches - pale yellow, calcareous, varved silty clay loam
- 49 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Nahon**Surface layer:**

- 0 to 7 inches - dark gray silt loam

Subsurface layer:

- 7 to 9 inches - gray silt loam

Subsoil:

- 9 to 15 inches - dark gray silty clay
- 15 to 21 inches - grayish brown silty clay
- 21 to 32 inches - light gray, calcareous silty clay loam with masses of salt and crystals of gypsum
- 32 to 43 inches - pale yellow, calcareous silty clay loam

Underlying layer:

- 43 to 49 inches - light yellowish brown, calcareous, varved silt loam with redox depletions
- 49 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Exline - somewhat poorly drained; Aberdeen - moderately well drained; Nahon - moderately well drained

Depth to restrictive feature: Exline - natric-top depth ranges from 0 to 6 inches; Aberdeen - none; Nahon - natric-top depth ranges from 6 to 17 inches

Depth to contrasting parent material: Exline - greater than 40 inches over glacial till; Aberdeen - greater than 40 inches over glacial till; Nahon - greater than 40 inches over glacial till

Depth to high water table: Exline - 1.5 to 3.5 feet; Aberdeen - 3.5 to 5 feet; Nahon - 3.5 to 5 feet

Flooding: Exline - none; Aberdeen - none; Nahon - none

Ponding: Exline - none; Aberdeen - none; Nahon - none

Permeability: Exline - very slow; Aberdeen - slow; Nahon - very slow

Available water capacity: Exline - moderate; Aberdeen - high; Nahon - moderate

Organic matter content: Exline - moderately low; Aberdeen - moderate; Nahon - moderate

Surface runoff: Exline - low; Aberdeen - low; Nahon - low

Inclusions**Contrasting inclusions:**

- Moderately well drained Harmony soils which do not have a sodium-affected subsoil on lower backslopes
- Poorly drained Heil soils in basins

Similar inclusions:

- Soils that are less than 40 inches to loamy glacial till
- Soils that are greater than 60 inches to loamy glacial till

Use and Management**Cropland or pasture**

- Main crops: Exline - unsuited; Aberdeen and Nahon - barley, spring wheat, alfalfa, and sunflowers
- Suitability for cropland: Generally unsuited

Management concerns:

Exline and Nahon - sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability;
Aberdeen - slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.
Seed cultivated areas to adapted grasses.

Interpretive Groups

Land capability classification: Exline - VIs; Aberdeen - IIIs; Nahon - IVs

Ecological site: Exline - Thin Claypan; Aberdeen - Clayey; Nahon - Claypan

Conservation tree and shrub group: Exline - 10; Aberdeen - 4; Nahon - 9C

Forage suitability group: Exline - Not Suited; Aberdeen - Clayey Subsoil;
Nahon - Claypan

Ew—Exline-Heil silt loams, 0 to 2 percent slopes**Composition**

Exline and similar soils: 45 to 60 percent

Heil and similar soils: 30 to 45 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Lake plains

Landform position: Exline - footslopes; Heil - basins

Slope range: Exline - 0 to 2 percent; Heil - 0 to 1 percent

Shape of areas: Irregular

Size of areas: 20 to 100 acres

Typical Profile**Exline****Surface layer:**

0 to 2 inches - gray silt loam

Subsoil:

2 to 12 inches - dark gray silty clay

12 to 21 inches - grayish brown silty clay with masses of salt and nests of gypsum

21 to 40 inches - light brownish gray, calcareous silty clay loam with masses of salt and nests of gypsum in the upper part

Underlying layer:

40 to 56 inches - light gray, calcareous, varved silt loam with redox concentrations and depletions

56 to 80 inches - pale yellow, calcareous, varved silt loam with redox concentrations and depletions

Heil**Surface layer:**

0 to 2 inches - gray silt loam with redox concentrations

Subsoil:

- 2 to 24 inches - dark gray silty clay with masses of salt and crystals of gypsum in the lower part
- 24 to 39 inches - gray, calcareous silty clay loam with masses of salt and crystals of gypsum
- 39 to 47 inches - light brownish gray, calcareous silty clay loam with masses of salt, crystals of gypsum, and redox concentrations and depletions

Underlying layer:

- 47 to 80 inches - pale olive, calcareous silty clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Exline - somewhat poorly drained; Heil - poorly drained

Depth to restrictive feature: Exline - natric-top depth ranges from 0 to 6 inches; Heil - natric-top depth ranges from 1 to 4 inches

Depth to contrasting parent material: Exline - greater than 60 inches; Heil - greater than 40 inches over glacial till and lacustrine

Depth to high water table: Exline - 1.5 to 3.5 feet; Heil - plus 1 to 1.5 feet

Flooding: Exline - none; Heil - none

Ponding: Exline - none; Heil - frequent for long periods

Permeability: Exline - very slow; Heil - very slow

Available water capacity: Exline - moderate; Heil - moderate

Organic matter content: Exline - moderately low; Heil - moderate

Surface runoff: Exline - low; Heil - negligible

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Moderately well drained Nahon and Aberdeen soils which do not have visible salts within a depth of 16 inches (Aberdeen soils have less exchangeable sodium than the Nahon soils) on footslopes

Similar inclusions:

Soils that have a thicker surface layer than the Heil soil

Use and Management**Rangeland**

Main crops: Unsited

Suitability for cropland: Unsited

Management concerns:

Exline - sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability; Heil - ponding, high water table, sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability

Management measures:

Proper grazing management helps to maintain plant vigor.

Restricting grazing during wet periods helps to limit compaction.

Seed cultivated areas to adapted grasses.

Interpretive Groups

Land capability classification: Exline - VIs; Heil - VIs

Ecological site: Exline - Thin Claypan; Heil - Closed Depression

Conservation tree and shrub group: Exline - 10; Heil - 10

Forage suitability group: Exline - Not Suited; Heil - Not Suited

Ex—Exline-Heil silt loams, till substratum, 0 to 2 percent slopes

Composition

Exline and similar soils: 45 to 60 percent

Heil and similar soils: 30 to 45 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Lake plains

Landform position: Exline - footslopes; Heil - basins

Slope range: Exline - 0 to 2 percent; Heil - 0 to 1 percent

Shape of areas: Irregular

Size of areas: 20 to 100 acres

Typical Profile

Exline

Surface layer:

0 to 2 inches - gray silt loam

Subsoil:

2 to 14 inches - dark gray silty clay

14 to 24 inches - grayish brown silty clay with masses of salt and nests of gypsum

24 to 39 inches - light gray, calcareous silty clay loam with masses of salt and nests of gypsum in the upper part

Underlying layer:

39 to 55 inches - pale yellow, calcareous, varved silty clay loam and silt loam with redox concentrations and depletions

55 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Heil

Surface layer:

0 to 2 inches - gray, silt loam with redox concentrations

Subsoil:

2 to 24 inches - dark gray silty clay with masses of salt and crystals of gypsum in the lower part

24 to 39 inches - gray, calcareous silty clay loam with masses of salt and crystals of gypsum

39 to 47 inches - light brownish gray, calcareous silty clay loam with masses of salt, crystals of gypsum, and redox concentrations and depletions

Underlying layer:

47 to 80 inches - pale olive, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Exline - somewhat poorly drained; Heil - poorly drained

Depth to restrictive feature: Exline - natric-top depth ranges from 0 to 6 inches;

Heil - natric-top depth ranges from 1 to 4 inches

Depth to contrasting parent material: Exline - greater than 40 inches over glacial till; Heil - greater than 40 inches over glacial till

Depth to high water table: Exline - 1.5 to 3.5 feet; Heil - plus 1 to 1.5 feet

Flooding: Exline - none; Heil - none

Ponding: Exline - none; Heil - frequent for long periods

Permeability: Exline - very slow; Heil - very slow

Available water capacity: Exline - moderate; Heil - moderate

Organic matter content: Exline - moderately low; Heil - moderate

Surface runoff: Exline - low; Heil - negligible

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Nahon and Aberdeen soils which do not have visible salts within a depth of 16 inches (Aberdeen soils have less exchangeable sodium than the Nahon soils) on footslopes

Similar inclusions:

Soils that are less than 40 inches to loamy glacial till

Soils that are greater than 60 inches to loamy glacial till

Use and Management

Rangeland

Main crops: Unsited

Suitability for cropland: Unsited

Management concerns:

Exline - sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability; Heil - ponding, high water table, sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability

Management measures:

Proper grazing management helps to maintain plant vigor.

Restricted grazing during wet periods helps to limit compaction.

Seed cultivated areas to adapted grasses.

Interpretive Groups

Land capability classification: Exline - VIs; Heil - VIs

Ecological site: Exline - Thin Claypan; Heil - Closed Depression

Conservation tree and shrub group: Exline - 10; Heil - 10

Forage suitability group: Exline - Not Suited; Heil - Not Suited

EyA—Exline-Putney silt loams, 1 to 4 percent slopes

Composition

Exline and similar soils: 40 to 50 percent

Putney and similar soils: 30 to 40 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Lake plains

Landform position: Exline - footslopes; Putney - summits and backslopes

Slope range: Exline - 1 to 3 percent; Putney - 2 to 4 percent

Shape of areas: Irregular

Size of areas: 5 to 100 acres

Typical Profile

Exline

Surface layer:

0 to 2 inches - gray silt loam

Subsoil:

2 to 12 inches - dark gray silty clay

12 to 21 inches - grayish brown silty clay with masses of salt and nests of gypsum

21 to 40 inches - light brownish gray, calcareous silty clay loam with masses of salt and nests of gypsum in the upper part

Underlying layer:

40 to 56 inches - light gray, calcareous, varved silt loam with redox concentrations and depletions

56 to 80 inches - pale yellow, calcareous, varved silt loam with redox concentrations and depletions

Putney

Surface layer:

0 to 7 inches - dark gray silt loam

Subsoil:

7 to 15 inches - grayish brown silt loam

15 to 19 inches - light yellowish brown, calcareous silt loam

19 to 37 inches - light yellowish brown, calcareous silt loam with masses of salt, nests of gypsum, and relict redox features

Underlying layer:

37 to 65 inches - pale yellow, calcareous, varved silt loam with relict redox features

65 to 80 inches - pale yellow, calcareous, varved silt loam, with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Exline - moderately well drained; Putney - well drained

Depth to restrictive feature: Exline - natric-top depth ranges from 0 to 6 inches; Putney - none

Depth to contrasting parent material: Exline - greater than 60 inches; Putney - greater than 60 inches

Depth to high water table: Exline - 3.5 to 5 feet; Putney - 4 to 6 feet

Flooding: Exline - none; Putney - none

Ponding: Exline - none; Putney - none

Permeability: Exline - very slow; Putney - moderate in the solum and moderate to slow in the underlying material

Available water capacity: Exline - moderate; Putney - high

Organic matter content: Exline - moderately low; Putney - moderate

Surface runoff: Exline - low; Putney - medium

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Aberdeen soils which have less exchangeable sodium than the Nahon soil and Nahon soils which do not have visible salts within a depth of 16 inches on footslopes

Somewhat poorly drained Bearden soils which are calcareous at or near the surface on footslopes

Poorly drained Heil soils in basins

Well drained Huffton soils which are calcareous at or near the surface and have gypsum and other salts in the subsoil on shoulders

Similar inclusions:

Soils that have salts at a depth greater than the Putney soil

Use and Management

Cropland or pasture

Main crops: Exline - unsuited; Putney - barley, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Generally unsuited

Management concerns:

Exline - sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability; Putney - water erosion, high salt content in the subsoil

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to control water erosion, conserve moisture, and maintain organic matter content and tilth.

Chiseling or subsoiling when the soils are dry increases permeability.

Seed cultivated areas to adapted grasses.

Interpretive Groups

Land capability classification: Exline - VI_s; Putney - II_e

Ecological site: Exline - Thin Claypan; Putney - Loamy

Conservation tree and shrub group: Exline - 10; Putney - 3

Forage suitability group: Exline - Not Suited; Putney - Loam

Fa—Farmsworth-Durrstein silt loams, 0 to 2 percent slopes

Composition

Farmsworth and similar soils: 45 to 60 percent

Durrstein and similar soils: 30 to 45 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Flood plains

Landform position: Farmsworth - microhighs; Durrstein - microlows

Slope range: Farmsworth - 0 to 2 percent; Durrstein - 0 to 1 percent

Shape of areas: Long and narrow

Size of areas: 20 to 100 acres

Typical Profile

Farmsworth

Surface layer:

0 to 5 inches - dark gray silt loam

Subsurface layer:

5 to 8 inches - gray silt loam

Subsoil:

- 8 to 12 inches - dark gray silty clay loam
- 12 to 19 inches - dark gray silty clay
- 19 to 25 inches - dark gray silty clay loam with masses of salt and nests of gypsum
- 25 to 43 inches - gray, calcareous silty clay loam with masses of salt and nests of gypsum

Underlying layer

- 43 to 52 inches - dark gray, calcareous silty clay loam
- 52 to 80 inches - gray, calcareous clay loam with redox concentrations and depletions

Durrstein**Surface layer:**

- 0 to 2 inches - gray silt loam

Subsoil:

- 2 to 14 inches - dark gray silty clay
- 14 to 32 inches - gray, calcareous silty clay with masses of salt, crystals of gypsum, and redox concentrations in the lower part
- 32 to 43 inches - gray, calcareous silty clay with masses of salt, crystals of gypsum, and redox concentrations

Underlying layer:

- 43 to 48 inches - black, calcareous silt clay loam
- 48 to 80 inches - gray, calcareous silty clay loam with redox concentrations

Soil Properties and Qualities

Drainage class: Farmsworth - somewhat poorly drained; Durrstein - poorly drained

Depth to restrictive feature: Farmsworth - natric-top depth ranges from 5 to 12 inches; Durrstein - natric-top depth ranges from 1 to 4 inches

Depth to contrasting parent material: Farmsworth - greater than 60 inches; Durrstein - greater than 60 inches

Depth to high water table: Farmsworth - 1.5 to 3 feet; Durrstein - 0 to 1.5 feet

Flooding: Farmsworth - rare for brief periods; Durrstein - frequent for brief periods

Ponding: Farmsworth - none; Durrstein - none

Permeability: Farmsworth - very slow; Durrstein - very slow

Available water capacity: Farmsworth - moderate; Durrstein - moderate

Organic matter content: Farmsworth - moderate; Durrstein - moderately low

Surface runoff: Farmsworth - low; Durrstein - very low

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Moderately well drained Davis soils which do not have a sodium-affected subsoil on high flood plains

Moderately well drained Northville soils which have less exchangeable sodium in the subsoil than the Farmsworth soil on high flood plains

Use and Management**Cropland or pasture**

Main crops: Farmsworth - sunflowers, barley, alfalfa, and spring wheat;

Durrstein - unsuited

Suitability for cropland: Generally unsuited

Management concerns:

Farmsworth - high water table, sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability;

Durrstein - flooding, high water table, sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability

Management measures:

Leaving crop residue on the surface, including grasses and legumes in the cropping system, and deferring tillage when the soil is wet help to maintain tilth and limit compaction.

Chiseling or subsoiling when the soils are dry increases permeability.

Seed cultivated areas to adapted grasses.

Interpretive Groups

Land capability classification: Farmsworth - IVs; Durrstein - VIs

Ecological site: Farmsworth - Claypan; Durrstein - Saline Lowland

Conservation tree and shrub group: Farmsworth - 9W; Durrstein - 10

Forage suitability group: Farmsworth - Claypan; Durrstein - Not Suited

Fe—Ferney-Heil complex, 0 to 2 percent slopes

Composition

Ferney and similar soils: 45 to 55 percent

Heil and similar soils: 30 to 45 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Ferney - footslopes; Heil - basins

Slope range: Ferney - 0 to 2 percent; Heil - 0 to 1 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Ferney

Surface layer:

0 to 3 inches - gray loam

Subsoil:

3 to 10 inches - dark gray clay

10 to 16 inches - dark grayish brown clay with masses of salt and nests of gypsum

16 to 32 inches - light brownish gray, calcareous clay loam with masses of salt and nests of gypsum

Underlying layer:

32 to 63 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

63 to 80 inches - pale yellow, calcareous clay loam with redox concentrations

Heil

Surface layer:

0 to 2 inches - gray, silt loam with redox concentrations

Subsoil:

2 to 24 inches - dark gray silty clay with masses of salt and crystals of gypsum in the lower part

24 to 39 inches - gray, calcareous silty clay loam with masses of salt and crystals of gypsum

39 to 47 inches - light brownish gray, calcareous silty clay loam with masses of salt, crystals of gypsum, and redox concentrations and depletions

Underlying layer:

47 to 80 inches - pale olive, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Ferney - somewhat poorly drained; Heil - poorly drained

Depth to restrictive feature: Ferney - natric-top depth ranges from 0 to 6 inches; Heil - natric-top depth ranges from 1 to 4 inches

Depth to contrasting parent material: Ferney - greater than 60 inches; Heil - greater than 40 inches over glacial till

Depth to high water table: Ferney - 1.5 to 3.5 feet; Heil - plus 1 to 1.5 feet

Flooding: Ferney - none; Heil - none

Ponding: Ferney - none; Heil - frequent for long periods

Permeability: Ferney - very slow; Heil - very slow

Available water capacity: Ferney - moderate; Heil - moderate

Organic matter content: Ferney - moderately low; Heil - moderate

Surface runoff: Ferney - low; Heil - negligible

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Cavour and Cresbard soils which do not have visible salts within a depth of 16 inches (Cresbard soils have less exchangeable sodium than the Cavour soils) on footslopes

Similar inclusions:

Soils that have a thicker surface layer than the Heil soil

Use and Management

Rangeland

Main crops: Unsited

Suitability for cropland: Unsited

Management concerns:

Ferney - sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability; Heil - ponding, high water table, sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability

Management measures:

Proper grazing management helps to maintain plant vigor.

Restricting grazing during wet periods helps to limit compaction.

Seed cultivated areas to adapted species.

Interpretive Groups

Land capability classification: Ferney - VIs; Heil - VIs

Ecological site: Ferney - Thin Claypan; Heil - Closed Depression

Conservation tree and shrub group: Ferney - 10; Heil - 10

Forage suitability group: Ferney - Not Suited; Heil - Not Suited

Ff—Forestburg-Elsmere loamy sands, 0 to 2 percent slopes

Composition

Forestburg and similar soils: 55 to 65 percent

Elsmere and similar soils: 25 to 40 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Forestburg - summits and backslopes; Elsmere - footslopes

Slope range: Forestburg - 0 to 2 percent; Elsmere - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Forestburg

Surface layer:

0 to 7 inches - dark gray loamy sand

Subsurface layer:

7 to 15 inches - dark grayish brown loamy sand

Subsoil:

15 to 19 inches - brown loamy sand

19 to 36 inches - pale brown, loamy sand with redox concentrations

36 to 53 inches - light gray, calcareous loam with redox concentrations and depletions

Underlying layer:

53 to 80 inches - pale yellow, calcareous loam with redox concentrations and depletions

Elsmere

Surface layer:

0 to 19 inches - dark gray loamy sand

Transitional layer:

19 to 29 inches - grayish brown loamy sand

Underlying layer:

29 to 46 inches - pale brown, loamy sand with redox concentrations

46 to 80 inches - light brownish gray and light gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Forestburg - moderately well drained; Elsmere - somewhat poorly drained

Depth to restrictive feature: Forestburg - none; Elsmere - none

Depth to contrasting parent material: Forestburg - 20 to 40 inches over glacial till; Elsmere - greater than 40 inches over glacial till

Depth to high water table: Forestburg - 2.5 to 4 feet; Elsmere - 1.5 to 2.5 feet

Flooding: Forestburg - none; Elsmere - none

Ponding: Forestburg - none; Elsmere - none

Permeability: Forestburg - rapid in the sandy sediments and moderately slow in the underlying glacial till; Elsmere - rapid in the sandy sediments and moderately slow in the underlying glacial till

Available water capacity: Forestburg - moderate; Elsmere - moderate

Organic matter content: Forestburg - moderately low; Elsmere - moderate

Surface runoff: Forestburg - very low; Elsmere - very low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Carthage soils which have less sand in the surface layer and subsoil than the Forestburg soil on backslopes

Poorly drained Lawet soils which are calcareous at or near the surface on toeslopes

Poorly drained Toko soils in basins

Similar inclusions:

Soils that have a greater depth to loamy glacial till than the Forestburg and Elsmere soils

Use and Management

Cropland

Main crops: Corn, soybeans, alfalfa, sunflowers, and spring wheat

Suitability for cropland: Fairly well suited

Management concerns:

Forestburg - wind erosion, moderate available water capacity, agrochemical leaching; Elsmere - wind erosion, agrochemical leaching

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to control wind erosion and conserve moisture.

Wind stripcropping and field windbreaks also help to control wind erosion.

The Forestburg soil is better suited to early-maturing crops such as small grains, except in years when a high water table is accessible by late-planted crops.

Timing nitrogen application close to the time crops will use it shortens the time available for leaching. Proper pesticide application is critical.

Interpretive Groups

Land capability classification: Forestburg - IVE; Elsmere - IVE

Ecological site: Forestburg - Sandy; Elsmere - Subirrigated

Conservation tree and shrub group: Forestburg - 1; Elsmere - 2

Forage suitability group: Forestburg - Sand; Elsmere - Subirrigated

Fh—Forestburg-Elsmere-Toko complex, 0 to 2 percent slopes

Composition

Forestburg and similar soils: 40 to 50 percent

Elsmere and similar soils: 25 to 35 percent

Toko and similar soils: 15 to 25 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Forestburg - summits and backslopes; Elsmere - footslopes;
Toko - basins

Slope range: Forestburg - 0 to 2 percent; Elsmere - 0 to 2 percent; Toko - 0 to 1 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Forestburg

Surface layer:

0 to 7 inches - dark gray loamy sand

Subsurface layer:

7 to 15 inches - dark grayish brown loamy sand

Subsoil:

15 to 19 inches - brown loamy sand

19 to 36 inches - pale brown loamy sand with redox concentrations

36 to 53 inches - light gray, calcareous loam with redox concentrations and depletions

Underlying layer:

53 to 80 inches - pale yellow, calcareous loam with redox concentrations and depletions

Elsmere

Surface layer:

0 to 19 inches - dark gray loamy sand

Transitional layer:

19 to 29 inches - grayish brown loamy sand

Underlying layer:

29 to 46 inches - pale brown, loamy sand with redox concentrations

46 to 80 inches - light brownish gray and light gray, calcareous clay loam with redox concentrations and depletions

Toko

Surface layer:

0 to 8 inches - dark gray fine sandy loam

Subsurface layer:

8 to 11 inches - light brownish gray, sandy loam with redox concentrations

Subsoil:

11 to 18 inches - gray, sandy clay loam with redox concentrations

18 to 28 inches - grayish brown, sandy clay loam with redox concentrations

28 to 38 inches - light gray, calcareous sandy loam with redox concentrations

Underlying layer:

38 to 56 inches - light yellowish brown, calcareous loamy sand, with redox concentrations and depletions

56 to 80 inches - light gray, calcareous clay loam, with redox concentrations and depletions

Soil Properties and Qualities

- Drainage class:** Forestburg - moderately well drained; Elsmere - somewhat poorly drained; Toko - poorly drained
- Depth to restrictive feature:** Forestburg - none; Elsmere - none; Toko - none
- Depth to contrasting parent material:** Forestburg - 20 to 40 inches over glacial till; Elsmere - greater than 40 inches over glacial till; Toko - greater than 20 inches over glacial till
- Depth to high water table:** Forestburg - 2.5 to 4 feet; Elsmere - 1.5 to 2.5 feet; Toko - plus 1 to 1.5 feet
- Flooding:** Forestburg - none; Elsmere - none; Toko - none
- Ponding:** Forestburg - none; Elsmere - none; Toko - frequent for long periods
- Permeability:** Forestburg - rapid in the sandy sediments and moderately slow in the underlying glacial till; Elsmere - rapid in the sandy sediments and moderately slow in the underlying glacial till; Toko - moderately slow
- Available water capacity:** Forestburg - moderate; Elsmere - moderate; Toko - moderate
- Organic matter content:** Forestburg - moderately low; Elsmere - moderate; Toko - high
- Surface runoff:** Forestburg - very low; Elsmere - very low; Toko - negligible

Inclusions

Contrasting inclusions:

- Moderately well drained Carthage soils which have less sand in the surface layer and subsoil than the Forestburg soil on backslopes
- Poorly drained Lawet soils which are calcareous at or near the surface on toeslopes

Similar inclusions:

- Soils that have a greater depth to loamy glacial till than the Forestburg soil
- Soils that have a lesser depth to loamy glacial till than the Elsmere soil

Use and Management

Cropland

- Main crops: Corn, soybeans, alfalfa, sunflowers, and spring wheat
- Suitability for cropland: Fairly well suited

Management concerns:

- Forestburg - wind erosion, moderate available water capacity, agrochemical leaching; Elsmere - wind erosion, agrochemical leaching; Toko - ponding, high water table, wind erosion

Management measures:

- Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to control wind erosion and conserve moisture.
- Wind stripcropping and field windbreaks also help to control wind erosion.
- The Forestburg soil is better suited to early-maturing crops such as small grains, except in years when a high water table is accessible by late-planted crops.
- The Toko soil is better suited to late-planted crops. Maintain existing drainage systems to remove excess water on the Toko soil.
- Timing nitrogen application close to the time crops will use it shortens the time available for leaching. Proper pesticide application is critical.

Interpretive Groups

Land capability classification: Forestburg - IVe; Elsmere - IVe; Toko - IVw

Ecological site: Forestburg - Sandy; Elsmere - Subirrigated; Toko - Wet Meadow

Conservation tree and shrub group: Forestburg - 1; Elsmere - 2; Toko - 10

Forage suitability group: Forestburg - Sand; Elsmere - Subirrigated; Toko - Wet

FmA—Forman-Aastad loams, 0 to 3 percent slopes

Composition

Forman and similar soils: 45 to 55 percent

Aastad and similar soils: 30 to 45 percent

Contrasting inclusions: 5 to 10 percent

Setting

Landform: Till plains

Landform position: Forman - summits and backslopes; Aastad - footslopes

Slope range: Forman - 0 to 3 percent; Aastad - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 5 to 200 acres

Typical Profile

Forman

Surface layer:

0 to 8 inches - dark gray loam

Subsoil:

8 to 15 inches - dark grayish brown clay loam

15 to 41 inches - light brownish gray, calcareous clay loam with relict redox features

Underlying layer:

41 to 63 inches - light yellowish brown, calcareous clay loam with relict redox features

63 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Aastad

Surface layer:

0 to 14 inches - dark gray loam

Subsoil:

14 to 21 inches - grayish brown clay loam

21 to 29 inches - light olive brown, clay loam with redox concentrations

29 to 43 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

43 to 57 inches - grayish brown, calcareous clay loam with redox concentrations and depletions

Underlying layer:

57 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Forman - well drained; Aastad - moderately well drained

Depth to restrictive feature: Forman - none; Aastad - none

Depth to contrasting parent material: Forman - greater than 60 inches;

Aastad - greater than 60 inches

Depth to high water table: Forman - 4 to 6 feet; Aastad - 3 to 5 feet

Flooding: Forman - none; Aastad - none

Ponding: Forman - none; Aastad - none

Permeability: Forman - moderately slow; Aastad - moderately slow

Available water capacity: Forman - high; Aastad - high

Organic matter content: Forman - moderate; Aastad - high

Surface runoff: Forman - low; Aastad - low

Other properties: Runoff water flows over the Aastad soil during periods of rainfall or snowmelt.

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Buse soils which are calcareous to the surface on shoulders

Moderately well drained Cresbard soils which have a sodium-affected subsoil on footslopes

Poorly drained Tonka soils in basins

Similar inclusions:

Soils that have more clay in the subsoil than the Forman soil

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Well suited

Management concerns:

Few limitations except to conserve moisture

Management measures:

Managing tillage and leaving crop residue conserves moisture and helps to maintain organic matter content and tilth.

Interpretive Groups

Land capability classification: Forman - IIc; Aastad - IIc

Ecological site: Forman - Loamy; Aastad - Loamy Overflow

Conservation tree and shrub group: Forman - 3; Aastad - 1

Forage suitability group: Forman - Loam; Aastad - Overflow

FmB—Forman-Aastad loams, 1 to 6 percent slopes

Composition

Forman and similar soils: 50 to 65 percent

Aastad and similar soils: 25 to 40 percent

Contrasting inclusions: 5 to 10 percent

Setting

Landform: Till plains

Landform position: Forman - summits and backslopes; Aastad - footslopes

Slope range: Forman - 3 to 6 percent; Aastad - 1 to 2 percent

Shape of areas: Irregular

Size of areas: 5 to 200 acres

Typical Profile

Forman

Surface layer:

0 to 8 inches - dark gray loam

Subsoil:

8 to 15 inches - dark grayish brown clay loam

15 to 41 inches - light brownish gray, calcareous clay loam with relict redox features

Underlying layer:

41 to 63 inches - light yellowish brown, calcareous clay loam with relict redox features

63 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Aastad

Surface layer:

0 to 14 inches - dark gray loam

Subsoil:

14 to 21 inches - grayish brown clay loam

21 to 29 inches - light olive brown, clay loam with redox concentrations

29 to 43 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

43 to 57 inches - grayish brown, calcareous clay loam with redox concentrations and depletions

Underlying layer:

57 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Forman - well drained; Aastad - moderately well drained

Depth to restrictive feature: Forman - none; Aastad - none

Depth to contrasting parent material: Forman - greater than 60 inches;
Aastad - greater than 60 inches

Depth to high water table: Forman - 4 to 6 feet; Aastad - 3 to 5 feet

Flooding: Forman - none; Aastad - none

Ponding: Forman - none; Aastad - none

Permeability: Forman - moderately slow; Aastad - moderately slow

Available water capacity: Forman - high; Aastad - high

Organic matter content: Forman - moderate; Aastad - high

Surface runoff: Forman - medium; Aastad - low

Other properties: Runoff water flows over the Aastad soil during periods of rainfall or snowmelt.

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Buse soils which are calcareous to the surface on shoulders

Moderately well drained Cresbard soils which have a sodium-affected subsoil on footslopes

Poorly drained Tonka soils in basins

Similar inclusions:

Soils that have more clay in the subsoil than the Forman soil

Use and Management**Cropland**

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Well suited

Management concerns:

Forman - water erosion; Aastad - few limitations except to conserve moisture

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control water erosion and conserve moisture.

Contour farming and grassed waterways also help to control water erosion, but slopes in most areas are too short or too irregular for contouring.

Interpretive Groups

Land capability classification: Forman - IIe; Aastad - IIc

Ecological site: Forman - Loamy; Aastad - Loamy Overflow

Conservation tree and shrub group: Forman - 3; Aastad - 1

Forage suitability group: Forman - Loam; Aastad - Overflow

FnC—Forman-Buse loams, 6 to 9 percent slopes**Composition**

Forman and similar soils: 50 to 60 percent

Buse and similar soils: 30 to 45 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Moraines

Landform position: Forman - backslopes; Buse - shoulders

Slope range: Forman - 6 to 9 percent; Buse - 6 to 9 percent

Shape of areas: Irregular

Size of areas: 5 to 50 acres

Typical Profile**Forman****Surface layer:**

0 to 8 inches - dark gray loam

Subsoil:

8 to 15 inches - dark grayish brown clay loam

15 to 41 inches - light brownish gray, calcareous clay loam with relict redox features

Underlying layer:

41 to 63 inches - light yellowish brown, calcareous clay loam with relict redox features

63 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Buse**Surface layer:**

0 to 7 inches - dark gray, calcareous loam

Subsoil:

7 to 21 inches - light brownish gray, calcareous loam

21 to 35 inches - light brownish gray, calcareous clay loam with relict redox features

Underlying layer:

35 to 63 inches - light yellowish brown, calcareous clay loam with relict redox features

63 to 80 inches - light brownish gray, calcareous clay loam with relict redox features

Soil Properties and Qualities

Drainage class: Forman - well drained; Buse - well drained

Depth to restrictive feature: Forman - none; Buse - none

Depth to contrasting parent material: Forman - greater than 60 inches;
Buse - greater than 60 inches

Depth to high water table: Forman - greater than 6 feet; Buse - greater than 6 feet

Flooding: Forman - none; Buse - none

Ponding: Forman - none; Buse - none

Permeability: Forman - moderately slow; Buse - moderately slow

Available water capacity: Forman - high; Buse - high

Organic matter content: Forman - moderate; Buse - moderately low

Surface runoff: Forman - medium; Buse - medium

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Moderately well drained Aastad soils which are dark to a depth greater than 16 inches on footslopes

Similar inclusions:

Soils that have a thinner surface layer than the Buse soil

Use and Management**Cropland**

Main crops: Spring wheat, alfalfa, corn, soybeans, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Forman - water erosion; Buse - water and wind erosion, high content of lime adversely affects the availability of plant nutrients

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control erosion and conserve moisture.

Contour farming, terraces, and grassed waterways also help to control water erosion, but slopes in some areas are too short or too irregular for contouring and terracing.

Applying animal wastes, especially on the Buse soil, helps maintain fertility.

Rotations including grasses and legumes help to control erosion and maintain organic matter content and tilth.

Interpretive Groups

Land capability classification: Forman - IIIe; Buse - IVe

Ecological site: Forman - Loamy; Buse - Thin Loamy

Conservation tree and shrub group: Forman - 3; Buse - 8K
Forage suitability group: Forman - Loam; Buse - Limy Upland

FrB—Forman-Buse-Aastad loams, 1 to 6 percent slopes

Composition

Forman and similar soils: 40 to 55 percent
Buse and similar soils: 25 to 35 percent
Aastad and similar soils: 15 to 25 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Forman - summits and backslopes; Buse - shoulders;
Aastad - footslopes

Slope range: Forman - 2 to 6 percent; Buse - 3 to 6 percent; Aastad - 1 to 3 percent

Shape of areas: Irregular

Size of areas: 5 to 500 acres

Typical Profile

Forman

Surface layer:

0 to 8 inches - dark gray loam

Subsoil:

8 to 15 inches - dark grayish brown clay loam

15 to 41 inches - light brownish gray, calcareous clay loam with relict redox features,

Underlying layer:

41 to 63 inches - light yellowish brown, calcareous clay loam with relict redox features

63 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Buse

Surface layer:

0 to 7 inches - dark gray, calcareous loam

Subsoil:

7 to 21 inches - light brownish gray, calcareous loam

21 to 35 inches - light brownish gray, calcareous clay loam with relict redox features

Underlying layer:

35 to 63 inches - light yellowish brown, calcareous clay loam with relict redox features

63 to 80 inches - light brownish gray, calcareous clay loam with relict redox features

Aastad

Surface layer:

0 to 14 inches - dark gray loam

Subsoil:

- 14 to 21 inches - grayish brown clay loam
- 21 to 29 inches - light olive brown, clay loam with redox concentrations
- 29 to 43 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions
- 43 to 57 inches - grayish brown, calcareous clay loam with redox concentrations and depletions

Underlying layer:

- 57 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Forman - well drained; Buse - well drained; Aastad - moderately well drained

Depth to restrictive feature: Forman - none; Buse - none; Aastad - none

Depth to contrasting parent material: Forman - greater than 60 inches; Buse - greater than 60 inches; Aastad - greater than 60 inches

Depth to high water table: Forman - 4 to 6 feet; Buse - greater than 6 feet; Aastad - 3 to 5 feet

Flooding: Forman - none; Buse - none; Aastad - none

Ponding: Forman - none; Buse - none; Aastad - none

Permeability: Forman - moderately slow; Buse - moderately slow; Aastad - moderately slow

Available water capacity: Forman - high; Buse - high; Aastad - high

Organic matter content: Forman - moderate; Buse - moderately low; Aastad - high

Surface runoff: Forman - medium; Buse - medium; Aastad - low

Other properties: Runoff water flows over the Aastad soil during periods of rainfall or snowmelt.

Inclusions**Contrasting inclusions:**

- Moderately well drained Cresbard soils which have a sodium-affected subsoil on footslopes
- Poorly drained Tonka soils in basins

Similar inclusions:

- Soils that have more clay in the subsoil than the Forman soil

Use and Management**Cropland**

- Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers
- Suitability for cropland: Fairly well suited

Management concerns:

- Forman - water erosion; Buse - water and wind erosion, high content of lime adversely affects the availability of plant nutrients; Aastad - few limitations except to conserve moisture

Management measures:

- Minimizing tillage and leaving crop residue on the surface help to control erosion and conserve moisture.
- Contour farming and grassed waterways also help to control water erosion, but slopes in most areas are too short or too irregular for contouring.
- Applying animal wastes, especially on the Buse soil, helps maintain fertility.
- Rotations including grasses and legumes help to control erosion, and maintain fertility, organic matter content, and tilth.

Interpretive Groups

Land capability classification: Forman - IIe; Buse - IIIe; Aastad - IIc

Ecological site: Forman - Loamy; Buse - Thin Loamy; Aastad - Loamy Overflow

Conservation tree and shrub group: Forman - 3; Buse - 8K; Aastad - 1

Forage suitability group: Forman - Loam; Buse - Limy Upland; Aastad - Overflow

FrC—Forman-Buse-Aastad loams, 2 to 9 percent slopes

Composition

Forman and similar soils: 40 to 50 percent

Buse and similar soils: 25 to 40 percent

Aastad and similar soils: 15 to 25 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Forman - backslopes; Buse - shoulders; Aastad - footslopes

Slope range: Forman - 6 to 9 percent; Buse - 6 to 9 percent; Aastad - 2 to 6 percent

Shape of areas: Irregular

Size of areas: 10 to 500 acres

Typical Profile

Forman

Surface layer:

0 to 8 inches - dark gray loam

Subsoil:

8 to 15 inches - dark grayish brown clay loam

15 to 41 inches - light brownish gray, calcareous clay loam with relict redox features

Underlying layer:

41 to 63 inches - light yellowish brown, calcareous clay loam with relict redox features

63 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Buse

Surface layer:

0 to 7 inches - dark gray, calcareous loam

Subsoil:

7 to 21 inches - light brownish gray, calcareous loam

21 to 35 inches - light brownish gray, calcareous clay loam with relict redox features

Underlying layer:

35 to 63 inches - light yellowish brown, calcareous clay loam with relict redox features

63 to 80 inches - light brownish gray, calcareous clay loam with relict redox features

Aastad**Surface layer:**

0 to 14 inches - dark gray loam

Subsoil:

14 to 21 inches - grayish brown clay loam

21 to 29 inches - light olive brown, clay loam with redox concentrations

29 to 43 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

43 to 57 inches - grayish brown, calcareous clay loam with redox concentrations and depletions

Underlying layer:

57 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Forman - well drained; Buse - well drained; Aastad - moderately well drained

Depth to restrictive feature: Forman - none; Buse - none; Aastad - none

Depth to contrasting parent material: Forman - greater than 60 inches;

Buse - greater than 60 inches; Aastad - greater than 60 inches

Depth to high water table: Forman - greater than 6 feet; Buse - greater than 6 feet; Aastad - 3 to 5 feet

Flooding: Forman - none; Buse - none; Aastad - none

Ponding: Forman - none; Buse - none; Aastad - none

Permeability: Forman - moderately slow; Buse - moderately slow; Aastad - moderately slow

Available water capacity: Forman - high; Buse - high; Aastad - high

Organic matter content: Forman - moderate; Buse - moderately low; Aastad - high

Surface runoff: Forman - medium; Buse - medium; Aastad - medium

Other properties: Runoff water flows over the Aastad soil during periods of rainfall or snowmelt.

Inclusions**Contrasting inclusions:**

Poorly drained Tonka soils in basins

Similar inclusions:

Soils that have more clay in the subsoil than the Forman soil

Soils that have a thinner surface layer than the Buse soil

Use and Management**Cropland**

Main crops: Spring wheat, alfalfa, corn, soybeans, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Forman - water erosion; Buse - water and wind erosion, high content of lime adversely affects the availability of plant nutrients; Aastad - water erosion

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control erosion and conserve moisture.

Contour farming, terraces, and grassed waterways also help to control water erosion, but slopes in most areas are too short or too irregular for contouring and terracing.

Applying animal wastes, especially on the Buse soil, helps maintain fertility.

Rotations including grasses and legumes help to control erosion and maintain fertility, organic matter content, and tilth.

Interpretive Groups

Land capability classification: Forman - IIIe; Buse - IVe; Aastad - IIe

Ecological site: Forman - Loamy; Buse - Thin Loamy; Aastad - Loamy

Conservation tree and shrub group: Forman - 3; Buse - 8K; Aastad - 1

Forage suitability group: Forman - Loam; Buse - Limy Upland; Aastad - Loam

FsA—Forman-Cresbard loams, 0 to 2 percent slopes

Composition

Forman and similar soils: 50 to 60 percent

Cresbard and similar soils: 25 to 35 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Till plains

Landform position: Forman - summits and backslopes; Cresbard - footslopes

Slope range: Forman - 0 to 2 percent; Cresbard - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Forman

Surface layer:

0 to 8 inches - dark gray loam

Subsoil:

8 to 15 inches - dark grayish brown clay loam

15 to 41 inches - light brownish gray, calcareous clay loam with relict redox features

Underlying layer:

41 to 63 inches - light yellowish brown, calcareous clay loam with relict redox features

63 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Cresbard

Surface layer:

0 to 6 inches - dark gray loam

Subsurface layer:

6 to 8 inches - gray loam

Transitional layer:

8 to 11 inches - dark gray and gray clay loam

Subsoil:

11 to 22 inches - dark gray clay loam

22 to 28 inches - pale yellow, calcareous clay loam

28 to 38 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Underlying layer:

38 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Forman - well drained; Cresbard - moderately well drained

Depth to restrictive feature: Forman - none; Cresbard - none

Depth to contrasting parent material: Forman - greater than 60 inches;
Cresbard - greater than 60 inches

Depth to high water table: Forman - 4 to 6 feet; Cresbard - 3.5 to 5 feet

Flooding: Forman - none; Cresbard - none

Ponding: Forman - none; Cresbard - none

Permeability: Forman - moderately slow; Cresbard - slow

Available water capacity: Forman - high; Cresbard - high

Organic matter content: Forman - moderate; Cresbard - moderate

Surface runoff: Forman - low; Cresbard - low

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Moderately well drained Aastad soils which do not have a sodium-affected subsoil and are dark to a depth greater than the 16 inches on footslopes

Moderately well drained Cavour soils which have a greater sodium-affected subsoil than the Cresbard soil on lower footslopes

Poorly drained Tonka soils in basins

Similar inclusions:

Soils that have more clay in the subsoil than the Forman soil

Use and Management**Cropland**

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Forman - few limitations except to conserve moisture; Cresbard - slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.

Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Forman - IIc; Cresbard - IIIs

Ecological site: Forman - Loamy; Cresbard - Clayey

Conservation tree and shrub group: Forman - 3; Cresbard - 4

Forage suitability group: Forman - Loam; Cresbard - Clayey Subsoil

FsB—Forman-Cresbard loams, 2 to 6 percent slopes**Composition**

Forman and similar soils: 55 to 65 percent

Cresbard and similar soils: 25 to 35 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Forman - summits and backslopes; Cresbard - footslopes

Slope range: Forman - 2 to 6 percent; Cresbard - 2 to 6 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Forman

Surface layer:

0 to 8 inches - dark gray loam

Subsoil:

8 to 15 inches - dark grayish brown clay loam

15 to 41 inches - light brownish gray, calcareous clay loam with relict redox features

Underlying layer:

41 to 63 inches - light yellowish brown, calcareous clay loam with relict redox features

63 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Cresbard

Surface layer:

0 to 6 inches - dark gray loam

Subsurface layer:

6 to 8 inches - gray loam

Transitional layer:

8 to 11 inches - dark gray and gray clay loam

Subsoil:

11 to 22 inches - dark gray clay loam

22 to 28 inches - pale yellow, calcareous clay loam

28 to 38 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Underlying layer:

38 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Forman - well drained; Cresbard - moderately well drained

Depth to restrictive feature: Forman - none; Cresbard - none

Depth to contrasting parent material: Forman - greater than 60 inches;
Cresbard - greater than 60 inches

Depth to high water table: Forman - 4 to 6 feet; Cresbard - 3.5 to 5 feet

Flooding: Forman - none; Cresbard - none

Ponding: Forman - none; Cresbard - none

Permeability: Forman - moderately slow; Cresbard - slow

Available water capacity: Forman - high; Cresbard - high

Organic matter content: Forman - moderate; Cresbard - moderate

Surface runoff: Forman - medium; Cresbard - medium

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Aastad soils which do not have a sodium-affected subsoil and are dark to a depth greater than the 16 inches on footslopes
Well drained Buse soils which are calcareous to the surface on shoulders
Moderately well drained Cavour soils which have more exchangeable sodium in the subsoil than the Cresbard soil on lower footslopes
Poorly drained Tonka soils in basins

Similar inclusions:

Soils that have more clay in the subsoil than the Forman soil

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers
Suitability for cropland: Fairly well suited

Management concerns:

Forman - water erosion; Cresbard - water erosion, slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to control water erosion, conserve moisture, and maintain organic matter content and tilth.
Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Forman - IIe; Cresbard - IIIe

Ecological site: Forman - Loamy; Cresbard - Clayey

Conservation tree and shrub group: Forman - 3; Cresbard - 4

Forage suitability group: Forman - Loam; Cresbard - Clayey Subsoil

FtA—Forman-Cresbard-Tonka complex, 0 to 2 percent slopes

Composition

Forman and similar soils: 40 to 50 percent
Cresbard and similar soils: 25 to 35 percent
Tonka and similar soils: 15 to 25 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Forman - summits and backslopes; Cresbard - footslopes; Tonka - basins

Slope range: Forman - 0 to 2 percent; Cresbard - 0 to 2 percent; Tonka - 0 to 1 percent

Shape of areas: Irregular

Size of areas: 10 to 150 acres

Typical Profile

Forman

Surface layer:

0 to 8 inches - dark gray loam

Subsoil:

8 to 15 inches - dark grayish brown clay loam

15 to 41 inches - light brownish gray, calcareous clay loam with relict redox features

Underlying layer:

41 to 63 inches - light yellowish brown, calcareous clay loam with relict redox features

63 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Cresbard

Surface layer:

0 to 6 inches - dark gray loam

Subsurface layer:

6 to 8 inches - gray loam

Transitional layer:

8 to 11 inches - dark gray and gray clay loam

Subsoil:

11 to 22 inches - dark gray clay loam

22 to 28 inches - pale yellow, calcareous clay loam

28 to 38 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Underlying layer:

38 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Tonka

Surface layer:

0 to 8 inches - dark gray silt loam

Subsurface layer:

8 to 16 inches - light gray, silt loam with redox concentrations

Subsoil:

16 to 35 inches - dark gray silty clay

35 to 41 inches - gray silty clay

Underlying layer:

41 to 68 inches - light gray, calcareous clay loam with redox concentrations and depletions

68 to 80 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Forman - well drained; Cresbard - moderately well drained;
Tonka - poorly drained

Depth to restrictive feature: Forman - none; Cresbard - none; Tonka - none

Depth to contrasting parent material: Forman - greater than 60 inches;
Cresbard - greater than 60 inches; Tonka - greater than 60 inches

Depth to high water table: Forman - 4 to 6 feet; Cresbard - 3.5 to 5 feet;
Tonka - plus 1 to 1.5 feet

Flooding: Forman - none; Cresbard - none; Tonka - none

Ponding: Forman - none; Cresbard - none; Tonka - frequent for long periods

Permeability: Forman - moderately slow; Cresbard - slow; Tonka - slow

Available water capacity: Forman - high; Cresbard - high; Tonka - high

Organic matter content: Forman - moderate; Cresbard - moderate; Tonka - high

Surface runoff: Forman - low; Cresbard - low; Tonka - negligible

Inclusions

Contrasting inclusions:

Moderately well drained Aastad soils which do not have a sodium-affected subsoil and are dark to a depth greater than 16 inches on footslopes

Moderately well drained Cavour soils which have less exchangeable sodium in the subsoil than the Cresbard soil on lower footslopes

Similar inclusions:

Soils that have more clay in the subsoil than the Forman soil

Soils that have a thinner surface layer than the Tonka soil

Use and Management

Cropland

Main crops: Forman and Cresbard - corn, soybeans, spring wheat, alfalfa, and sunflowers; Tonka - corn, soybeans, spring wheat, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Forman - few limitations except to conserve moisture; Cresbard - slow permeability; Tonka - ponding, high water table, slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.

The Tonka soil is better suited to late-planted crops. Maintain existing drainage systems to remove excess water on the Tonka soil.

Deferring tillage when the soils are wet helps to limit compaction.

Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Forman - IIc; Cresbard - IIIs; Tonka - IVw

Ecological site: Forman - Loamy; Cresbard - Clayey; Tonka - Wet Meadow

Conservation tree and shrub group: Forman - 3; Cresbard - 4; Tonka - 10

Forage suitability group: Forman - Loam; Cresbard - Clayey Subsoil; Tonka - Wet

Ga—Gardena very fine sandy loam, 0 to 2 percent slopes

Composition

Gardena and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Footslopes

Slope range: 0 to 2 percent

Shape of areas: Irregular

Size of areas: 20 to 200 acres

Typical Profile

Surface layer:

0 to 9 inches - dark gray very fine sandy loam

Subsurface layer:

9 to 20 inches - dark grayish brown very fine sandy loam

Subsoil:

20 to 28 inches - dark grayish brown very fine sandy loam

28 to 36 inches - brown very fine sandy loam

36 to 51 inches - pale yellow, calcareous very fine sandy loam

Underlying layer:

51 to 80 inches - pale yellow, calcareous loamy very fine sand

Soil Properties and Qualities

Drainage class: Moderately well drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: 3 to 5 feet

Flooding: None

Ponding: None

Permeability: Moderate

Available water capacity: High

Organic matter content: High

Surface runoff: Low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Camtown soils which have a sodium-affected subsoil on footslopes

Well drained Eckman soils which are dark to a depth less than 16 inches on backslopes

Moderately well drained Glyndon soils which are calcareous at or near the surface on footslopes

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Well suited

Management concerns:

Wind erosion

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control wind erosion and conserve moisture.

Wind stripcropping and field windbreaks also help to control wind erosion.

Interpretive Groups

Land capability classification: IIe

Ecological site: Loamy

Conservation tree and shrub group: 1

Forage suitability group: Overflow

Gd—Gardena-Glyndon silt loams, 0 to 2 percent slopes**Composition**

Gardena and similar soils: 45 to 60 percent

Glyndon and similar soils: 25 to 40 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Gardena - footslopes; Glyndon - lower footslopes

Slope range: Gardena - 0 to 2 percent; Glyndon - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 20 to 100 acres

Typical Profile**Gardena****Surface layer:**

0 to 9 inches - dark gray silt loam

Subsurface layer:

9 to 20 inches - dark grayish brown very fine sandy loam

Subsoil:

20 to 28 inches - dark grayish brown very fine sandy loam

28 to 36 inches - brown very fine sandy loam

36 to 51 inches - pale yellow, calcareous very fine sandy loam

Underlying layer:

51 to 80 inches - pale yellow, calcareous loamy very fine sand

Glyndon**Surface layer:**

0 to 12 inches - dark gray, calcareous silt loam

Subsoil:

12 to 29 inches - light gray, calcareous silt loam

29 to 46 inches - pale yellow, calcareous silt loam with redox concentrations

46 to 57 inches - light gray, calcareous silt loam with redox concentrations and depletions

Underlying layer:

57 to 80 inches - pale yellow, calcareous silt loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Gardena - moderately well drained; Glyndon - moderately well drained

Depth to restrictive feature: Gardena - none; Glyndon - none

Depth to contrasting parent material: Gardena - greater than 60 inches;
Glyndon - greater than 60 inches

Depth to high water table: Gardena - 3 to 5 feet; Glyndon - 2.5 to 4 feet

Flooding: Gardena - none; Glyndon - none

Ponding: Gardena - none; Glyndon - none

Permeability: Gardena - moderate; Glyndon - moderate

Available water capacity: Gardena - high; Glyndon - high

Organic matter content: Gardena - high; Glyndon - moderate

Surface runoff: Gardena - low; Glyndon - low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Camtown soils which have a sodium-affected subsoil on footslopes

Well drained Eckman soils which are dark to a depth less than 16 inches on backslopes

Poorly drained Tonka soils in basins

Similar inclusions:

Soils that have more very fine sand and less silt in the surface layer than the Gardena soil

Use and Management

Cropland

Main crops: Spring wheat, corn, barley, sunflowers, and soybeans

Suitability for cropland: Well suited

Management concerns:

Gardena - few limitations except to conserve moisture; Glyndon - wind erosion, high content of lime adversely affects the availability of plant nutrients

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control wind erosion, conserve moisture, and maintain organic matter content and tilth.

Rotations including grasses and legumes help to control wind erosion and maintain organic matter content and tilth.

Interpretive Groups

Land capability classification: Gardena - IIc; Glyndon - IIe

Ecological site: Gardena - Loamy; Glyndon - Limy Subirrigated

Conservation tree and shrub group: Gardena - 1; Glyndon - 2KK

Forage suitability group: Gardena - Overflow; Glyndon - Subirrigated

Ge—Gardena-Turton very fine sandy loams, 0 to 2 percent slopes

Composition

Gardena and similar soils: 45 to 55 percent

Turton and similar soils: 30 to 40 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Lake plains

Landform position: Gardena - footslopes; Turton - lower footslopes

Slope range: Gardena - 0 to 2 percent; Turton - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Gardena

Surface layer:

0 to 9 inches - dark gray very fine sandy loam

Subsurface layer:

9 to 20 inches - dark grayish brown very fine sandy loam

Subsoil:

20 to 28 inches - dark grayish brown very fine sandy loam

28 to 36 inches - brown very fine sandy loam

36 to 51 inches - pale yellow, calcareous very fine sandy loam

Underlying layer:

51 to 80 inches - pale yellow, calcareous loamy very fine sand

Turton

Surface layer:

0 to 8 inches - dark gray very fine sandy loam

Subsurface layer:

8 to 10 inches - gray very fine sandy loam

Subsoil:

10 to 14 inches - dark gray silty clay loam

14 to 24 inches - dark grayish brown silty clay loam

24 to 38 inches - light gray, calcareous silt loam with redox concentrations

Underlying layer:

38 to 80 inches - pale yellow, calcareous very fine sandy loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Gardena - moderately well drained; Turton - moderately well drained

Depth to restrictive feature: Gardena - none; Turton - natric-top depth ranges from 9 to 22 inches

Depth to contrasting parent material: Gardena - greater than 60 inches; Turton - greater than 60 inches

Depth to high water table: Gardena - 3 to 5 feet; Turton - 3.5 to 5 feet

Flooding: Gardena - none; Turton - none

Ponding: Gardena - none; Turton - none

Permeability: Gardena - moderate; Turton - slow

Available water capacity: Gardena - high; Turton - moderate

Organic matter content: Gardena - high; Turton - moderate

Surface runoff: Gardena - low; Turton - low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Camtown soils which have a lesser sodium-affected subsoil than the Turton soil on footslopes

Well drained Eckman soils which are dark to a depth less than 16 inches on backslopes

Moderately well drained Glyndon soils which are calcareous at or near the surface on footslopes

Use and Management

Cropland

Main crops: Spring wheat, corn, barley, alfalfa, sunflowers, and soybeans

Suitability for cropland: Fairly well suited

Management concerns:

Gardena - wind erosion; Turton - wind erosion, sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to control wind erosion, conserve moisture, and maintain organic matter content and tilth.

Wind stripcropping and field windbreaks also help to control wind erosion.

Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Gardena - IIe; Turton - IVe

Ecological site: Gardena - Loamy; Turton - Claypan

Conservation tree and shrub group: Gardena - 1; Turton - 9C

Forage suitability group: Gardena - Overflow; Turton - Claypan

GgA—Great Bend silt loam, 0 to 2 percent slopes

Composition

Great Bend and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Summits and backslopes

Slope range: 0 to 2 percent

Shape of areas: Irregular

Size of areas: 20 to 200 acres

Typical Profile

Surface layer:

0 to 7 inches - dark gray silt loam

Subsoil:

7 to 12 inches - grayish brown silt loam

12 to 32 inches - pale yellow, calcareous silt loam

Underlying layer:

32 to 53 inches - pale yellow, calcareous, varved silt loam

53 to 80 inches - pale yellow, calcareous, varved silt loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Well drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: 4 to 6 feet

Flooding: None

Ponding: None

Permeability: Moderate in the solum and moderate to slow in the underlying material

Available water capacity: High

Organic matter content: Moderate

Surface runoff: Low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Beotia soils which are dark to a depth greater than 16 inches on footslopes

Moderately well drained Harmony soils which have more clay and less silt in the subsoil on backslopes

Poorly drained Tonka soils in basins

Well drained Zell soils which are calcareous to the surface on shoulders

Similar inclusions:

Soils that have gypsum and other salts within a depth of 20 inches of the surface

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Well suited

Management concerns:

Few limitations except to conserve moisture

Management measures:

Minimizing tillage and leaving crop residue conserves moisture and helps to maintain organic matter content and tilth.

Interpretive Groups

Land capability classification: IIc

Ecological site: Loamy

Conservation tree and shrub group: 3

Forage suitability group: Loam

GnA—Great Bend-Beotia silt loams, 0 to 2 percent slopes

Composition

Great Bend and similar soils: 45 to 60 percent

Beotia and similar soils: 35 to 45 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Great Bend - summits and backslopes; Beotia - footslopes

Slope range: Great Bend - 0 to 2 percent; Beotia - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Great Bend

Surface layer:

0 to 7 inches - dark gray silt loam

Subsoil:

7 to 12 inches - grayish brown silt loam

12 to 32 inches - pale yellow, calcareous silt loam

Underlying layer

32 to 53 inches - pale yellow, calcareous, varved silt loam

53 to 80 inches - pale yellow, calcareous, varved silt loam with redox concentrations and depletions

Beotia

Surface layer:

0 to 9 inches - dark gray silt loam

Subsoil:

9 to 17 inches - dark grayish brown silty clay loam

17 to 21 inches - light olive brown silt loam

21 to 39 inches - pale yellow, calcareous silt loam

Underlying layer:

39 to 80 inches - pale yellow, calcareous, varved silty clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Great Bend - well drained; Beotia - well drained

Depth to restrictive feature: Great Bend - none; Beotia - none

Depth to contrasting parent material: Great Bend - greater than 60 inches;
Beotia - greater than 60 inches

Depth to high water table: Great Bend - 4 to 6 feet; Beotia - 4 to 6 feet

Flooding: Great Bend - none; Beotia - none

Ponding: Great Bend - none; Beotia - none

Permeability: Great Bend - moderate in the solum and moderate to slow in the underlying material; Beotia - moderate in the solum and moderate to slow in the underlying material

Available water capacity: Great Bend - high; Beotia - high

Organic matter content: Great Bend - moderate; Beotia - high

Surface runoff: Great Bend - low; Beotia - low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Harmony soils which have more clay and less silt in the subsoil than the Beotia soil on footslopes

Poorly drained Tonka soils in basins

Somewhat poorly drained Winship soils which are dark to a depth greater than 30 inches on toeslopes

Similar inclusions:

Soils that have gypsum and other salts closer to the surface than the Great Bend soil

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Well suited

Management concerns:

Few limitations except to conserve moisture

Management measures:

Minimizing tillage and leaving crop residue conserves moisture and helps to maintain organic matter content and tilth.

Interpretive Groups

Land capability classification: Great Bend - IIc; Beotia - IIc

Ecological site: Great Bend - Loamy; Beotia - Loamy

Conservation tree and shrub group: Great Bend - 3; Beotia - 1

Forage suitability group: Great Bend - Loam; Beotia - Loam

GnB—Great Bend-Beotia silt loams, 1 to 6 percent slopes

Composition

Great Bend and similar soils: 50 to 65 percent

Beotia and similar soils: 25 to 40 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Great Bend - summits and backslopes; Beotia - footslopes

Slope range: Great Bend - 2 to 6 percent; Beotia - 1 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Great Bend

Surface layer:

0 to 7 inches - dark gray silt loam

Subsoil:

7 to 12 inches - grayish brown silt loam

12 to 32 inches - pale yellow, calcareous silt loam

Underlying layer:

32 to 53 inches - pale yellow, calcareous, varved silt loam

53 to 80 inches - pale yellow, calcareous, varved silt loam with redox concentrations and depletions

Beotia

Surface layer:

0 to 9 inches - dark gray silt loam

Subsoil:

9 to 17 inches - dark grayish brown silty clay loam

17 to 21 inches - light olive brown silt loam

21 to 39 inches - pale yellow, calcareous silt loam

Underlying layer:

39 to 80 inches - pale yellow, calcareous, varved silty clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Great Bend - well drained; Beotia - well drained

Depth to restrictive feature: Great Bend - none; Beotia - none

Depth to contrasting parent material: Great Bend - greater than 60 inches;
Beotia - greater than 60 inches

Depth to high water table: Great Bend - 4 to 6 feet; Beotia - 4 to 6 feet

Flooding: Great Bend - none; Beotia - none

Ponding: Great Bend - none; Beotia - none

Permeability: Great Bend - moderate in the solum and moderate to slow in the underlying material; Beotia - moderate in the solum and moderate to slow in the underlying material

Available water capacity: Great Bend - high; Beotia - high

Organic matter content: Great Bend - moderate; Beotia - high

Surface runoff: Great Bend - medium; Beotia - low

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Moderately well drained Harmony soils which have more clay and less silt in the subsoil on footslopes

Well drained Zell soils which are calcareous to the surface on shoulders

Similar inclusions:

Soils that have gypsum and other salts closer to the surface than the Great Bend soil

Use and Management**Cropland**

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Well suited

Management concerns:

Great Bend - water erosion; Beotia - few limitations except to conserve moisture

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control water erosion and conserve moisture.

Contour farming and grassed waterways also help to control water erosion, but slopes in some areas are too short or too irregular for contouring.

Interpretive Groups

Land capability classification: Great Bend - IIe; Beotia - IIc

Ecological site: Great Bend - Loamy; Beotia - Loamy

Conservation tree and shrub group: Great Bend - 3; Beotia - 1

Forage suitability group: Great Bend - Loam; Beotia - Loam

GoA—Great Bend-Beotia silt loams, till substratum, 0 to 2 percent slopes

Composition

Great Bend and similar soils: 45 to 60 percent

Beotia and similar soils: 35 to 45 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Great Bend - summits and backslopes; Beotia - footslopes

Slope range: Great Bend - 0 to 2 percent; Beotia - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Great Bend

Surface layer:

0 to 7 inches - dark gray silt loam

Subsoil:

7 to 14 inches - brown silt loam

14 to 20 inches - light yellowish brown, calcareous silt loam

20 to 29 inches - pale yellow, calcareous silt loam

Underlying layer:

29 to 49 inches - light gray, calcareous, varved silt loam

49 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Beotia

Surface layer:

0 to 12 inches - dark gray silt loam

Subsoil:

12 to 18 inches - dark gray silty clay loam

18 to 27 inches - grayish brown silty clay loam

27 to 39 inches - light gray, calcareous silt loam

39 to 46 inches - pale yellow, calcareous silt loam

Underlying layer:

46 to 52 inches - light yellowish brown, calcareous, varved silt loam with redox concentrations and depletions

52 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Great Bend - well drained; Beotia - well drained

Depth to restrictive feature: Great Bend - none; Beotia - none

Depth to contrasting parent material: Great Bend - greater than 40 inches over glacial till; Beotia - greater than 40 inches over glacial till

Depth to high water table: Great Bend - 4 to 6 feet; Beotia - 4 to 6 feet

Flooding: Great Bend - none; Beotia - none

Ponding: Great Bend - none; Beotia - none

Permeability: Great Bend - moderate in the solum and moderate to slow in the underlying material; Beotia - moderate in the solum and moderate to slow in the underlying material

Available water capacity: Great Bend - high; Beotia - high

Organic matter content: Great Bend - moderate; Beotia - high

Surface runoff: Great Bend - low; Beotia - low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Harmony soils which have more clay and less silt in the subsoil than the Beotia soil on footslopes

Poorly drained Tonka soils in basins

Somewhat poorly drained Winship soils which are dark to a depth greater than 30 inches on toeslopes

Similar inclusions:

Soils that are greater than 60 inches to loamy glacial till

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Well suited

Management concerns:

Few limitations except to conserve moisture

Management measures:

Minimizing tillage and leaving crop residue conserves moisture and helps to maintain organic matter content and tilth.

Interpretive Groups

Land capability classification: Great Bend - IIc; Beotia - IIc

Ecological site: Great Bend - Loamy; Beotia - Loamy

Conservation tree and shrub group: Great Bend - 3; Beotia - 1

Forage suitability group: Great Bend - Loam; Beotia - Loam

GpA—Great Bend-Putney silt loams, 0 to 2 percent slopes

Composition

Great Bend and similar soils: 45 to 60 percent

Putney and similar soils: 30 to 40 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Lake plains

Landform position: Great Bend - summits and backslopes; Putney - backslopes

Slope range: Great Bend - 0 to 2 percent; Putney - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Great Bend

Surface layer:

0 to 7 inches - dark gray silt loam

Subsoil:

7 to 12 inches - grayish brown silt loam

12 to 32 inches - pale yellow, calcareous silt loam

Underlying layer:

32 to 53 inches - pale yellow, calcareous, varved silt loam

53 to 80 inches - pale yellow, calcareous, varved silt loam with redox concentrations and depletions

Putney

Surface layer:

0 to 7 inches - dark gray silt loam

Subsoil:

7 to 15 inches - grayish brown silt loam

15 to 19 inches - light yellowish brown, calcareous silt loam

19 to 37 inches - light yellowish brown, calcareous silt loam with masses of salt, nests of gypsum, and relict redox features

Underlying layer:

37 to 65 inches - pale yellow, calcareous, varved silt loam with relict redox features

65 to 80 inches - pale yellow, calcareous, varved silt loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Great Bend - well drained; Putney - well drained

Depth to restrictive feature: Great Bend - none; Putney - none

Depth to contrasting parent material: Great Bend - greater than 60 inches;
Putney - greater than 60 inches

Depth to high water table: Great Bend - 4 to 6 feet; Putney - 4 to 6 feet

Flooding: Great Bend - none; Putney - none

Ponding: Great Bend - none; Putney - none

Permeability: Great Bend - moderate in the solum and moderate to slow in the underlying material; Putney - moderate in the solum and moderate to slow in the underlying material

Available water capacity: Great Bend - high; Putney - high

Organic matter content: Great Bend - moderate; Putney - moderate

Surface runoff: Great Bend - low; Putney - low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Beotia soils which are dark to a depth greater than 16 inches on footslopes

Moderately well drained Rondell soils which are calcareous at or near the surface on footslopes

Poorly drained Tonka soils in basins

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Well suited

Management concerns:

Great Bend - few limitations except to conserve moisture; Putney - high salt content in the subsoil

Management measures:

Minimizing tillage and leaving crop residue on the surface help to conserve moisture.

Rotations including grasses and legumes help to maintain organic matter content and tilth.

Interpretive Groups

Land capability classification: Great Bend - IIc; Putney - IIs

Ecological site: Great Bend - Loamy; Putney - Loamy

Conservation tree and shrub group: Great Bend - 3; Putney - 3

Forage suitability group: Great Bend - Loam; Putney - Loam

GpB—Great Bend-Putney silt loams, 2 to 4 percent slopes

Composition

Great Bend and similar soils: 45 to 60 percent

Putney and similar soils: 30 to 40 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Lake plains

Landform position: Great Bend - summits and backslopes; Putney - backslopes

Slope range: Great Bend - 2 to 4 percent; Putney - 2 to 4 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Great Bend

Surface layer:

0 to 7 inches - dark gray silt loam

Subsoil:

7 to 12 inches - grayish brown silt loam

12 to 32 inches - pale yellow, calcareous silt loam

Underlying layer

32 to 53 inches - pale yellow, calcareous, varved silt loam

53 to 80 inches - pale yellow, calcareous, varved silt loam with redox concentrations and depletions

Putney

Surface layer:

0 to 7 inches - dark gray silt loam

Subsoil:

7 to 15 inches - grayish brown silt loam

15 to 19 inches - light yellowish brown, calcareous silt loam

19 to 37 inches - light yellowish brown, calcareous silt loam with masses of salt, nests of gypsum, and relict redox features

Underlying layer:

37 to 65 inches - pale yellow, calcareous, varved silt loam with relict redox features

65 to 80 inches - pale yellow, calcareous, varved silt loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Great Bend - well drained; Putney - well drained

Depth to restrictive feature: Great Bend - none; Putney - none

Depth to contrasting parent material: Great Bend - greater than 60 inches; Putney - greater than 60 inches

Depth to high water table: Great Bend - 4 to 6 feet; Putney - 4 to 6 feet

Flooding: Great Bend - none; Putney - none

Ponding: Great Bend - none; Putney - none

Permeability: Great Bend - moderate in the solum and moderate to slow in the underlying material; Putney - moderate in the solum and moderate to slow in the underlying material

Available water capacity: Great Bend - high; Putney - high

Organic matter content: Great Bend - moderate; Putney - moderate

Surface runoff: Great Bend - medium; Putney - medium

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Beotia soils which are dark to a depth greater than 16 inches on footslopes

Well drained Huffton soils which are calcareous to the surface and contain nests of salt and gypsum near the surface on shoulders

Moderately well drained Rondell soils which are calcareous at or near the surface on footslopes

Well drained Zell soils which are calcareous to the surface on shoulders

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Well suited

Management concerns:

Great Bend - water erosion; Putney - water erosion, high salt content in the subsoil

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control water erosion and conserve moisture.

Contour farming and grassed waterways also help to control water erosion, but slopes in some areas are too short or too irregular for contouring.

Rotations including grasses and legumes help to control erosion and maintain organic matter content and tilth.

Interpretive Groups

Land capability classification: Great Bend - IIe; Putney - IIe

Ecological site: Great Bend - Loamy; Putney - Loamy

Conservation tree and shrub group: Great Bend - 3; Putney - 3

Forage suitability group: Great Bend - Loam; Putney - Loam

GtB—Great Bend-Zell silt loams, 2 to 6 percent slopes

Composition

Great Bend and similar soils: 55 to 65 percent

Zell and similar soils: 25 to 35 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Great Bend - backslopes; Zell - shoulders

Slope range: Great Bend - 2 to 6 percent; Zell - 2 to 6 percent

Shape of areas: Irregular

Size of areas: 5 to 50 acres

Typical Profile

Great Bend

Surface layer:

0 to 7 inches - dark gray silt loam

Subsoil:

7 to 12 inches - grayish brown silt loam

12 to 32 inches - pale yellow, calcareous silt loam

Underlying layer:

32 to 53 inches - pale yellow, calcareous, varved silt loam

53 to 80 inches - pale yellow, calcareous, varved silt loam with redox concentrations and depletions

Zell

Surface layer:

0 to 7 inches - dark grayish brown, calcareous silt loam

Subsoil:

7 to 31 inches - pale yellow, calcareous silt loam

Underlying layer:

31 to 49 inches - pale yellow, calcareous, varved silt loam

49 to 80 inches - pale yellow, calcareous, varved silt loam with relict redox features

Soil Properties and Qualities

Drainage class: Great Bend - well drained; Zell - well drained

Depth to restrictive feature: Great Bend - none; Zell - none

Depth to contrasting parent material: Great Bend - greater than 60 inches;
Zell - greater than 60 inches

Depth to high water table: Great Bend - 4 to 6 feet; Zell - greater than 6 feet

Flooding: Great Bend - none; Zell - none

Ponding: Great Bend - none; Zell - none

Permeability: Great Bend - moderate in the solum and moderate to slow in the underlying material; Zell - moderate in the solum and moderate to slow in the underlying material

Available water capacity: Great Bend - high; Zell - high

Organic matter content: Great Bend - moderate; Zell - moderately low

Surface runoff: Great Bend - medium; Zell - medium

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Beotia soils which are dark to a depth greater than 16 inches on footslopes

Well drained Huffton soils which contain nests of salt and gypsum near the surface on shoulders

Somewhat poorly drained Winship soils which are dark to a depth greater than 30 inches on toeslopes

Similar inclusions:

Soils that have more very fine sand and less silt than the Great Bend soil

Soils that have gypsum and other salts closer to the surface than the Great Bend soil

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Well suited

Management concerns:

Great Bend - water erosion; Zell - water and wind erosion, high content of lime adversely affects the availability of plant nutrients

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control erosion and conserve moisture.

Contour farming and grassed waterways also help to control water erosion, but slopes in some areas are too short or too irregular for contouring.

Applying animal wastes, especially on the Zell soil, helps maintain fertility.

Rotations including grasses and legumes help to control erosion and maintain fertility, organic matter content, and tilth.

Interpretive Groups

Land capability classification: Great Bend - IIe; Zell - IIIe

Ecological site: Great Bend - Loamy; Zell - Thin Loamy

Conservation tree and shrub group: Great Bend - 3; Zell - 8K

Forage suitability group: Great Bend - Loam; Zell - Limy Upland

GtC—Great Bend-Zell silt loams, 4 to 9 percent slopes

Composition

Great Bend and similar soils: 45 to 60 percent

Zell and similar soils: 30 to 45 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Great Bend - backslopes; Zell - shoulders

Slope range: Great Bend - 6 to 9 percent; Zell - 6 to 9 percent

Shape of areas: Irregular

Size of areas: 5 to 50 acres

Typical Profile

Great Bend

Surface layer:

0 to 7 inches - dark gray silt loam

Subsoil:

7 to 12 inches - grayish brown silt loam

12 to 32 inches - pale yellow, calcareous silt loam

Underlying layer:

32 to 53 inches - pale yellow, silt loam

53 to 80 inches - pale yellow, calcareous, varved silt loam with redox concentrations and depletions

Zell

Surface layer:

0 to 7 inches - dark grayish brown, calcareous silt loam

Subsoil:

7 to 31 inches - pale yellow, calcareous silt loam

Underlying layer:

31 to 49 inches - pale yellow, calcareous, varved silt loam

49 to 80 inches - pale yellow, calcareous, varved silt loam with relict redox features

Soil Properties and Qualities

Drainage class: Great Bend - well drained; Zell - well drained

Depth to restrictive feature: Great Bend - none; Zell - none

Depth to contrasting parent material: Great Bend - greater than 60 inches;
Zell - greater than 60 inches

Depth to high water table: Great Bend - greater than 6 feet; Zell - greater than 6 feet

Flooding: Great Bend - none; Zell - none

Ponding: Great Bend - none; Zell - none

Permeability: Great Bend - moderate in the solum and moderate to slow in the underlying material; Zell - moderate in the solum and moderate to slow in the underlying material

Available water capacity: Great Bend - high; Zell - high

Organic matter content: Great Bend - moderate; Zell - moderately low

Surface runoff: Great Bend - medium; Zell - medium

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Beotia soils which are dark to a depth greater than 16 inches on footslopes

Well drained Huffton soils which contain nests of salt and gypsum near the surface on shoulders

Similar inclusions:

Soils that have more very fine sand and less silt than the Great Bend soil

Soils that have gypsum and other salts closer to the surface than the Great Bend soil

Use and Management

Cropland

Main crops: Spring wheat, alfalfa, corn, sunflowers, and soybeans

Suitability for cropland: Fairly well suited

Management concerns:

Great Bend - water erosion; Zell - water and wind erosion, high content of lime adversely affects the availability of plant nutrients

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control erosion and conserve moisture.

Contour farming, terraces, and grassed waterways also help to control water erosion, but slopes in some areas are too short or too irregular for contouring and terracing.

Applying animal wastes, especially on the Zell soil, helps maintain fertility.

Rotations including grasses and legumes help to control erosion and maintain fertility, organic matter content, and tilth.

Interpretive Groups

Land capability classification: Great Bend - IIIe; Zell - IVe

Ecological site: Great Bend - Loamy; Zell - Thin Loamy

Conservation tree and shrub group: Great Bend - 3; Zell - 8K

Forage suitability group: Great Bend - Loam; Zell - Limy Upland

GzC—Great Bend-Zell-Huffton silt loams, 4 to 9 percent slopes

Composition

Great Bend and similar soils: 40 to 50 percent

Zell and similar soils: 25 to 35 percent

Huffton and similar soils: 15 to 25 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Great Bend - backslopes; Zell - shoulders; Huffton - shoulders

Slope range: Great Bend - 4 to 9 percent; Zell - 6 to 9 percent; Huffton - 6 to 9 percent

Shape of areas: Irregular

Size of areas: 5 to 50 acres

Typical Profile

Great Bend

Surface layer:

0 to 7 inches - dark gray silt loam

Subsoil:

7 to 12 inches - grayish brown silt loam

12 to 32 inches - pale yellow, calcareous silt loam

Underlying layer:

32 to 53 inches - pale yellow silt loam

53 to 80 inches - pale yellow, calcareous, varved silt loam with redox concentrations and depletions

Zell

Surface layer:

0 to 7 inches - dark grayish brown, calcareous silt loam

Subsoil:

7 to 31 inches - pale yellow, calcareous silt loam

Underlying layer:

31 to 49 inches - pale yellow, calcareous, varved silt loam

49 to 80 inches - pale yellow, calcareous, varved silt loam with relict redox features

Huffton

Surface layer:

0 to 7 inches - dark gray, calcareous silt loam

Subsoil:

7 to 18 inches - light gray, calcareous silt loam

18 to 28 inches - pale yellow, calcareous silt loam with nests of gypsum and masses of salt

Underlying layer:

28 to 48 inches - pale yellow, calcareous, varved silt loam with relict redox features

48 to 80 inches - pale yellow, calcareous, varved silt loam with relict redox features

Soil Properties and Qualities

Drainage class: Great Bend - well drained; Zell - well drained; Huffton - well drained

Depth to restrictive feature: Great Bend - none; Zell - none; Huffton - none

Depth to contrasting parent material: Great Bend - greater than 60 inches; Zell - greater than 60 inches; Huffton - greater than 60 inches

Depth to high water table: Great Bend - greater than 6 feet; Zell - greater than 6 feet; Huffton - greater than 6 feet

Flooding: Great Bend - none; Zell - none; Huffton - none

Ponding: Great Bend - none; Zell - none; Huffton - none

Permeability: Great Bend - moderate in the solum and moderate to slow in the underlying material; Zell - moderate in the solum and moderate to slow in the underlying material; Huffton - moderate in the solum and moderate to slow in the underlying material

Available water capacity: Great Bend - high; Zell - high; Huffton - moderate

Organic matter content: Great Bend - moderate; Zell - moderately low; Huffton - moderately low

Surface runoff: Great Bend - medium; Zell - medium; Huffton - medium

Inclusions

Contrasting inclusions:

Moderately well drained Rondell soils which are calcareous at or near the surface on footslopes

Well drained Beotia soils which are dark to a depth greater than 16 inches on footslopes

Similar inclusions:

Soils that have more very fine sand and less silt than the Great Bend soil

Soils that have gypsum and other salts closer to the surface than the Great Bend soil

Use and Management

Cropland

Main crops: Barley, spring wheat, alfalfa, corn, sunflowers, and soybeans
Suitability for cropland: Fairly well suited

Management concerns:

Great Bend - water erosion; Zell - water and wind erosion, high content of lime adversely affects the availability of plant nutrients; Huffton - water and wind erosion, high salt content in the subsoil, high content of lime adversely affects the availability of plant nutrients

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control erosion and conserve moisture.
Contour farming, terraces, and grassed waterways also help to control water erosion, but slopes in some areas are too short or too irregular for contouring or terracing.
Applying animal wastes, especially on the Zell and Huffton soils, helps maintain fertility.
Rotations including grasses and legumes help to control erosion, and maintain fertility, organic matter content, and tilth.

Interpretive Groups

Land capability classification: Great Bend - IIIe; Zell - IVe; Huffton - IVe

Ecological site: Great Bend - Loamy; Zell - Thin Loamy; Huffton - Thin Loamy

Conservation tree and shrub group: Great Bend - 3; Zell - 8K; Huffton - 9L

Forage suitability group: Great Bend - Loam; Zell - Limy Upland; Huffton - Saline

HaA—Hamerly loam, 0 to 2 percent slopes

Composition

Hamerly and similar soils: 75 to 90 percent
Contrasting inclusions: 10 to 25 percent

Setting

Landform: Till plains

Landform position: Footslopes

Slope range: 0 to 2 percent

Shape of areas: Long and narrow

Size of areas: 5 to 50 acres

Typical Profile

Surface layer:

0 to 9 inches - dark gray, calcareous loam

Subsoil:

9 to 14 inches - light gray, calcareous loam

14 to 29 inches - light brownish gray, calcareous loam with redox concentrations

Underlying layer:

29 to 68 inches - light olive gray, calcareous clay loam with redox concentrations and depletions

68 to 80 inches - light gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Depth to restrictive feature: None
Depth to contrasting parent material: Greater than 60 inches
Depth to high water table: 1.5 to 3.5 feet
Flooding: None
Ponding: None
Permeability: Moderately slow
Available water capacity: High
Organic matter content: Moderate
Surface runoff: Low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Aastad soils which are not calcareous at or near the surface and are dark to a depth greater than 16 inches on footslopes
Poorly drained Tonka soils in basins
Poorly drained Vallers soils on toeslopes

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers
Suitability for cropland: Fairly well suited

Management concerns:

Wind erosion, high content of lime adversely affects the availability of plant nutrients

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control wind erosion.
Rotations including grasses and legumes help to control wind erosion and maintain organic matter content and tilth.

Interpretive Groups

Land capability classification: IIe
Ecological site: Limy Subirrigated
Conservation tree and shrub group: 2KK
Forage suitability group: Subirrigated

Hb—Hamerly-Tonka complex, 0 to 2 percent slopes

Composition

Hamerly and similar soils: 45 to 60 percent
Tonka and similar soils: 30 to 45 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains
Landform position: Hamerly - footslopes; Tonka - basins
Slope range: Hamerly - 0 to 2 percent; Tonka - 0 to 1 percent
Shape of areas: Irregular
Size of areas: 10 to 50 acres

Typical Profile

Hamerly

Surface layer:

0 to 9 inches - dark gray, calcareous loam

Subsoil:

9 to 14 inches - light gray, calcareous loam

14 to 29 inches - light brownish gray, calcareous loam with redox concentrations

Underlying layer:

29 to 68 inches - light olive gray, calcareous clay loam with redox concentrations and depletions

68 to 80 inches - light gray, calcareous clay loam with redox concentrations and depletions

Tonka

Surface layer:

0 to 8 inches - dark gray silt loam

Subsurface layer:

8 to 16 inches - light gray, silt loam with redox concentrations

Subsoil:

16 to 35 inches - dark gray silty clay

35 to 41 inches - gray silty clay

Underlying layer:

41 to 68 inches - light gray, calcareous clay loam with redox concentrations and depletions

68 to 80 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Hamerly - somewhat poorly drained; Tonka - poorly drained

Depth to restrictive feature: Hamerly - none; Tonka - none

Depth to contrasting parent material: Hamerly - greater than 60 inches;

Tonka - greater than 60 inches

Depth to high water table: Hamerly - 1.5 to 3.5 feet; Tonka - plus 1 to 1.5 feet

Flooding: Hamerly - none; Tonka - none

Ponding: Hamerly - none; Tonka - frequent for long periods

Permeability: Hamerly - moderately slow; Tonka - slow

Available water capacity: Hamerly - high; Tonka - high

Organic matter content: Hamerly - moderate; Tonka - high

Surface runoff: Hamerly - low; Tonka - negligible

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Aastad soils which are not calcareous at or near the surface on footslopes

Very poorly drained Parnell soils in basins

Poorly drained Vallers soils on toeslopes

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, sunflowers, and barley

Suitability for cropland: Fairly well suited

Management concerns:

Hamerly - wind erosion, high content of lime adversely affects the availability of plant nutrients; Tonka - ponding, high water table, slow permeability

Management measures:

Rotations including grasses and legumes help to control wind erosion and maintain organic matter content and tilth.

Leaving crop residue on the surface and deferring tillage when the soils are wet help to maintain tilth, control wind erosion, and limit compaction.

These soils are better suited to late-planted crops.

Interpretive Groups

Land capability classification: Hamerly - IIe; Tonka - IVw

Ecological site: Hamerly - Limy Subirrigated; Tonka - Wet Meadow

Conservation tree and shrub group: Hamerly - 2KK; Tonka - 10

Forage suitability group: Hamerly - Subirrigated; Tonka - Wet

HcA—Hand-Bonilla loams, 0 to 3 percent slopes**Composition**

Hand and similar soils: 45 to 55 percent

Bonilla and similar soils: 30 to 45 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Hand - summits and backslopes; Bonilla - footslopes

Slope range: Hand - 0 to 3 percent; Bonilla - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile**Hand****Surface layer:**

0 to 7 inches - dark gray loam

Subsoil:

7 to 18 inches - grayish brown loam

18 to 35 inches - pale yellow, calcareous loam

Underlying layer:

35 to 52 inches - light yellowish brown, calcareous loam with relict redox features

52 to 80 inches - light yellowish brown and pale yellow, calcareous loam with redox concentrations and depletions

Bonilla**Surface layer:**

0 to 8 inches - dark gray loam

Subsoil:

8 to 18 inches - dark gray loam

18 to 27 inches - dark grayish brown loam

27 to 36 inches - light brownish gray, calcareous loam

36 to 47 inches - pale yellow, calcareous loam, with redox concentrations and depletions

Underlying layer:

47 to 80 inches - pale yellow, calcareous loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Hand - well drained; Bonilla - moderately well drained

Depth to restrictive feature: Hand - none; Bonilla - none

Depth to contrasting parent material: Hand - greater than 60 inches;
Bonilla - greater than 60 inches

Depth to high water table: Hand - 4 to 6 feet; Bonilla - 3.5 to 5 feet

Flooding: Hand - none; Bonilla - none

Ponding: Hand - none; Bonilla - none

Permeability: Hand - moderate; Bonilla - moderately slow

Available water capacity: Hand - high; Bonilla - high

Organic matter content: Hand - moderate; Bonilla - high

Surface runoff: Hand - low; Bonilla - low

Other properties: Runoff water flows over the Bonilla soil during periods of rainfall or snowmelt.

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Ethan soils which are calcareous to the surface on shoulders

Moderately well drained Stickney soils which have a sodium-affected subsoil on footslopes

Poorly drained Tetonka soils in basins

Similar inclusions:

Soils that have more clay in the subsoil than the Hand soil

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Well suited

Management concerns:

Few limitations except to conserve moisture

Management measures:

Managing tillage and leaving crop residue conserves moisture and helps to maintain organic matter content and tilth.

Interpretive Groups

Land capability classification: Hand - IIc; Bonilla - IIc

Ecological site: Hand - Loamy; Bonilla - Loamy Overflow

Conservation tree and shrub group: Hand - 3; Bonilla - 1

Forage suitability group: Hand - Loam; Bonilla - Overflow

HcB—Hand-Bonilla loams, 1 to 6 percent slopes

Composition

Hand and similar soils: 50 to 65 percent

Bonilla and similar soils: 25 to 40 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Hand - summits and backslopes; Bonilla - footslopes

Slope range: Hand - 2 to 6 percent; Bonilla - 1 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Hand

Surface layer:

0 to 7 inches - dark gray loam

Subsoil:

7 to 18 inches - grayish brown loam

18 to 35 inches - pale yellow, calcareous loam

Underlying layer:

35 to 52 inches - light yellowish brown, calcareous loam with relict redox features

52 to 80 inches - light yellowish brown and pale yellow, calcareous loam with redox concentrations and depletions

Bonilla

Surface layer:

0 to 8 inches - dark gray loam

Subsoil:

8 to 18 inches - dark gray loam

18 to 27 inches - dark grayish brown loam

27 to 36 inches - light brownish gray, calcareous loam

36 to 47 inches - pale yellow, calcareous loam with redox concentrations and depletions

Underlying layer:

47 to 80 inches - pale yellow, calcareous loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Hand - well drained; Bonilla - moderately well drained

Depth to restrictive feature: Hand - none; Bonilla - none

Depth to contrasting parent material: Hand - greater than 60 inches;
Bonilla - greater than 60 inches

Depth to high water table: Hand - 4 to 6 feet; Bonilla - 3.5 to 5 feet

Flooding: Hand - none; Bonilla - none

Ponding: Hand - none; Bonilla - none

Permeability: Hand - moderate; Bonilla - moderately slow

Available water capacity: Hand - high; Bonilla - high

Organic matter content: Hand - moderate; Bonilla - high

Surface runoff: Hand - medium; Bonilla - low

Other properties: Runoff water flows over the Bonilla soil during periods of rainfall or snowmelt.

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Ethan soils which are calcareous to the surface on shoulders

Moderately well drained Stickney soils which have a sodium-affected subsoil on footslopes

Poorly drained Tetonka soils in basins

Similar inclusions:

Soils that have more clay in the subsoil than the Hand soil

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Well suited

Management concerns:

Hand - water erosion; Bonilla - few limitations except to conserve moisture

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control erosion and conserve moisture.

Contour farming and grassed waterways help to control water erosion, but slopes in most areas are too short or too irregular for contouring.

Interpretive Groups

Land capability classification: Hand - IIe; Bonilla - IIc

Ecological site: Hand - Loamy; Bonilla - Loamy Overflow

Conservation tree and shrub group: Hand - 3; Bonilla - 1

Forage suitability group: Hand - Loam; Bonilla - Overflow

HdA—Hand-Carthage fine sandy loams, 0 to 3 percent slopes

Composition

Hand and similar soils: 45 to 60 percent

Carthage and similar soils: 30 to 45 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains (fig. 10)

Landform position: Hand - summits and backslopes; Carthage - footslopes

Slope range: Hand - 0 to 3 percent; Carthage - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Hand

Surface layer:

0 to 7 inches - dark gray fine sandy loam

Subsoil:

7 to 18 inches - grayish brown loam

18 to 35 inches - pale yellow, calcareous loam

Underlying layer:

35 to 52 inches - light yellowish brown, calcareous loam with relict redox features

52 to 80 inches - light yellowish brown and pale yellow, calcareous loam with redox concentrations and depletions

Carthage

Surface layer:

0 to 16 inches - dark gray fine sandy loam

Subsoil:

16 to 24 inches - dark grayish brown fine sandy loam

Underlying layer:

24 to 43 inches - light brownish gray, calcareous loam with redox concentrations and depletions

43 to 80 inches - light gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Hand - well drained; Carthage - moderately well drained

Depth to restrictive feature: Hand - none; Carthage - none

Depth to contrasting parent material: Hand - greater than 60 inches;
Carthage - 20 to 40 inches over glacial till

Depth to high water table: Hand - 4 to 6 feet; Carthage - 3 to 4 feet

Flooding: Hand - none; Carthage - none

Ponding: Hand - none; Carthage - none

Permeability: Hand - moderate; Carthage - moderately rapid in the loamy sediments and moderately slow in the underlying glacial till

Available water capacity: Hand - high; Carthage - moderate

Organic matter content: Hand - moderate; Carthage - moderate

Surface runoff: Hand - low; Carthage - low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Ethan soils which are calcareous to the surface on shoulders

Moderately well drained Forestburg soils which have more sand in the surface layer and subsoil than the Carthage soils on backslopes

Poorly drained Toko soils in basins



Figure 10. An alfalfa field in an area of Hand-Carthage fine sandy loams, 0 to 3 percent slopes. The Hand soils are on summits and backslopes and the Carthage soils are on footslopes.

Similar inclusions:

Soils that have less sand in the surface layer than the Hand soil
Soils that have a greater depth to loamy glacial till than the Carthage soil

Use and Management**Cropland**

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers
Suitability for cropland: Fairly well suited

Management concerns:

Hand - wind erosion; Carthage - wind erosion, moderate available water capacity

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to control wind erosion and conserve moisture.

Wind stripcropping and field windbreaks also help to control wind erosion.

The Carthage soil is better suited to early-maturing crops such as small grains, except in years when a high water table is accessible by late-planted crops.

Interpretive Groups

Land capability classification: Hand - IIIe; Carthage - IIIe

Ecological site: Hand - Sandy; Carthage - Sandy

Conservation tree and shrub group: Hand - 3; Carthage - 5

Forage suitability group: Hand - Loam; Carthage - Droughty Loam

He—Hand-Carthage-Overshue fine sandy loams, 0 to 3 percent slopes**Composition**

Hand and similar soils: 40 to 50 percent

Carthage and similar soils: 25 to 35 percent

Overshue and similar soils: 15 to 25 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Hand - summits and backslopes; Carthage - footslopes; Overshue - basins

Slope range: Hand - 0 to 3 percent; Carthage - 0 to 2 percent; Overshue - 0 to 1 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile**Hand****Surface layer:**

0 to 7 inches - dark gray fine sandy loam

Subsoil:

7 to 18 inches - grayish brown loam

18 to 35 inches - pale yellow, calcareous loam

Underlying layer:

35 to 52 inches - light yellowish brown, calcareous loam with relict redox features

52 to 80 inches - light yellowish brown and pale yellow, calcareous loam with redox concentrations and depletions

Carthage**Surface layer:**

0 to 16 inches - dark gray fine sandy loam

Subsoil:

16 to 24 inches - dark grayish brown fine sandy loam

Underlying layer:

24 to 43 inches - light brownish gray, calcareous loam with redox concentrations and depletions

43 to 80 inches - light gray, calcareous clay loam with redox concentrations and depletions

Overshue**Surface layer:**

0 to 7 inches - dark gray, fine sandy loam with redox concentrations

Subsoil:

7 to 22 inches - grayish brown, fine sandy loam with redox concentrations

22 to 32 inches - light olive brown, fine sandy loam with redox concentrations

32 to 42 inches - light yellowish brown, sandy loam with redox concentrations and depletions

42 to 57 inches - light gray, calcareous clay loam with redox concentrations and depletions

Underlying layer:

57 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations

Soil Properties and Qualities

Drainage class: Hand - well drained; Carthage - moderately well drained; Overshue - poorly drained

Depth to restrictive feature: Hand - none; Carthage - none; Overshue - none

Depth to contrasting parent material: Hand - greater than 60 inches; Carthage - 20 to 40 inches over glacial till; Overshue - greater than 40 inches over glacial till

Depth to high water table: Hand - 4 to 6 feet; Carthage - 3 to 4 feet; Overshue - plus 1 to 1.5 feet

Flooding: Hand - none; Carthage - none; Overshue - none

Ponding: Hand - none; Carthage - none; Overshue - occasional for long periods

Permeability: Hand - moderate; Carthage - moderately rapid in the loamy sediments and moderately slow in the underlying glacial till; Overshue - moderately rapid in the loamy sediments and moderately slow in the underlying glacial till

Available water capacity: Hand - high; Carthage - moderate; Overshue - moderate

Organic matter content: Hand - moderate; Carthage - moderate; Overshue - high

Surface runoff: Hand - low; Carthage - low; Overshue - negligible

Inclusions**Contrasting inclusions:**

Well drained Ethan soils which are calcareous to the surface on shoulders

Moderately well drained Forestburg soils which have more sand in the surface layer and subsoil than the Carthage soils on backslopes

Similar inclusions:

Soils that have less sand in the surface layer than the Hand soil

Soils that have a greater depth to loamy glacial till than the Carthage soil

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Hand - wind erosion; Carthage - wind erosion, moderate available water capacity; Overshue - ponding, high water table, wind erosion

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to control wind erosion and conserve moisture.

Wind stripcropping and field windbreaks also help to control wind erosion.

The Carthage soil is better suited to early-maturing crops such as small grains, except in years when a high water table is accessible by late-planted crops.

The Overshue soil is better suited to late-planted crops.

Interpretive Groups

Land capability classification: Hand - IIIe; Carthage - IIIe; Overshue - IVw

Ecological site: Hand - Sandy; Carthage - Sandy; Overshue - Wet Meadow

Conservation tree and shrub group: Hand - 3; Carthage - 5; Overshue - 10

Forage suitability group: Hand - Loam; Carthage - Droughty Loam; Overshue - Wet

HfC—Hand-Ethan loams, 6 to 9 percent slopes

Composition

Hand and similar soils: 50 to 60 percent

Ethan and similar soils: 30 to 45 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Moraines

Landform position: Hand - backslopes; Ethan - shoulders

Slope range: Hand - 6 to 9 percent; Ethan - 6 to 9 percent

Shape of areas: Irregular

Size of areas: 5 to 50 acres

Typical Profile

Hand

Surface layer:

0 to 7 inches - dark gray loam

Subsoil:

7 to 18 inches - grayish brown loam

18 to 35 inches - pale yellow, calcareous loam

Underlying layer:

35 to 52 inches - light yellowish brown, calcareous loam with relict redox features

52 to 80 inches - light yellowish brown and pale yellow, calcareous loam with redox concentrations and depletions

Ethan**Surface layer:**

0 to 8 inches - grayish brown, calcareous loam

Subsoil:

8 to 20 inches - light yellowish brown, calcareous clay loam

20 to 35 inches - pale yellow, calcareous clay loam

Underlying layer:

35 to 68 inches - light yellowish brown, calcareous clay loam with relict redox features

68 to 80 inches - pale yellow, calcareous clay loam with relict redox features

Soil Properties and Qualities

Drainage class: Hand - well drained; Ethan - well drained

Depth to restrictive feature: Hand - none; Ethan - none

Depth to contrasting parent material: Hand - greater than 60 inches;
Ethan - greater than 60 inches

Depth to high water table: Hand - greater than 6 feet; Ethan - greater than 6 feet

Flooding: Hand - none; Ethan - none

Ponding: Hand - none; Ethan - none

Permeability: Hand - moderate; Ethan - moderately slow

Available water capacity: Hand - high; Ethan - high

Organic matter content: Hand - moderate; Ethan - moderately low

Surface runoff: Hand - medium; Ethan - medium

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Moderately well drained Bonilla soils which are dark to a depth greater than 20 inches on footslopes

Similar inclusions:

Soils that have more clay in the subsoil than the Hand soil

Soils that have a thinner surface layer than the Ethan soil

Use and Management**Cropland**

Main crops: Spring wheat, alfalfa, corn, soybeans, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Hand - water erosion; Ethan - water and wind erosion, high content of lime adversely affects the availability of plant nutrients

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control erosion and conserve moisture.

Contour farming, terraces, and grassed waterways also help to control water erosion, but slopes in some areas are too short or too irregular for contouring or terracing.

Applying animal wastes, especially on the Ethan soil, helps maintain fertility.

Rotations including grasses and legumes help to control erosion and maintain fertility, organic matter content, and tilth.

Interpretive Groups

Land capability classification: Hand - IIIe; Ethan - IVe

Ecological site: Hand - Loamy; Ethan - Thin Upland

Conservation tree and shrub group: Hand - 3; Ethan - 8K

Forage suitability group: Hand - Loam; Ethan - Limy Upland

HgB—Hand-Ethan-Bonilla loams, 1 to 6 percent slopes

Composition

Hand and similar soils: 40 to 55 percent

Ethan and similar soils: 25 to 35 percent

Bonilla and similar soils: 15 to 25 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Hand - summits and backslopes; Ethan - shoulders;
Bonilla - footslopes

Slope range: Hand - 2 to 6 percent; Ethan - 2 to 6 percent; Bonilla - 1 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Hand

Surface layer:

0 to 7 inches - dark gray loam

Subsoil:

7 to 18 inches - grayish brown loam

18 to 35 inches - pale yellow, calcareous loam

Underlying layer:

35 to 52 inches - light yellowish brown, calcareous loam with relict redox features

52 to 80 inches - light yellowish brown and pale yellow, calcareous loam with redox concentrations and depletions

Ethan

Surface layer:

0 to 8 inches - grayish brown, calcareous loam

Subsoil:

8 to 20 inches - light yellowish brown, calcareous clay loam

20 to 35 inches - pale yellow, calcareous clay loam

Underlying layer:

35 to 68 inches - light yellowish brown, calcareous clay loam with relict redox features

68 to 80 inches - pale yellow, calcareous clay loam with relict redox features

Bonilla

Surface layer:

0 to 8 inches - dark gray loam

Subsoil:

- 8 to 18 inches - dark gray loam
- 18 to 27 inches - dark grayish brown loam
- 27 to 36 inches - light brownish gray, calcareous loam
- 36 to 47 inches - pale yellow, calcareous loam with redox concentrations and depletions

Underlying layer:

- 47 to 80 inches - pale yellow, calcareous loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Hand - well drained; Ethan - well drained; Bonilla - moderately well drained

Depth to restrictive feature: Hand - none; Ethan - none; Bonilla - none

Depth to contrasting parent material: Hand - greater than 60 inches;
Ethan - greater than 60 inches; Bonilla - greater than 60 inches

Depth to high water table: Hand - 4 to 6 feet; Ethan - greater than 6 feet;
Bonilla - 3.5 to 5 feet

Flooding: Hand - none; Ethan - none; Bonilla - none

Ponding: Hand - none; Ethan - none; Bonilla - none

Permeability: Hand - moderate; Ethan - moderately slow; Bonilla - moderately slow

Available water capacity: Hand - high; Ethan - high; Bonilla - high

Organic matter content: Hand - moderate; Ethan - moderately low; Bonilla - high

Surface runoff: Hand - medium; Ethan - medium; Bonilla - low

Other properties: Runoff water flows over the Bonilla soil during periods of rainfall or snowmelt.

Inclusions**Contrasting inclusions:**

- Somewhat poorly drained Crossplain soils on toeslopes
- Poorly drained Tetonka soils in basins

Similar inclusions:

- Soils that have more clay in the subsoil than the Hand soil

Use and Management**Cropland**

- Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers
- Suitability for cropland: Fairly well suited

Management concerns:

- Hand - water erosion; Ethan - water and wind erosion, high content of lime adversely affects the availability of plant nutrients; Bonilla - few limitations except to conserve moisture

Management measures:

- Minimizing tillage and leaving crop residue on the surface help to control erosion and conserve moisture.
- Contour farming and grassed waterways also help to control water erosion, but slopes in most areas are too short or too irregular for contouring.
- Applying animal wastes, especially on the Ethan soil, helps maintain fertility.
- Rotations including grasses and legumes help to control erosion, and maintain fertility, organic matter content, and tilth.

Interpretive Groups

Land capability classification: Hand - IIe; Ethan - IIIe; Bonilla - IIc

Ecological site: Hand - Loamy; Ethan - Thin Upland; Bonilla - Loamy Overflow

Conservation tree and shrub group: Hand - 3; Ethan - 8K; Bonilla - 1

Forage suitability group: Hand - Loam; Ethan - Limy Upland; Bonilla - Overflow

HgC—Hand-Ethan-Bonilla loams, 2 to 9 percent slopes

Composition

Hand and similar soils: 40 to 50 percent

Ethan and similar soils: 25 to 40 percent

Bonilla and similar soils: 15 to 25 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Hand - backslopes; Ethan - shoulders; Bonilla - footslopes

Slope range: Hand - 6 to 9 percent; Ethan - 6 to 9 percent; Bonilla - 2 to 6 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Hand

Surface layer:

0 to 7 inches - dark gray loam

Subsoil:

7 to 18 inches - grayish brown loam

18 to 35 inches - pale yellow, calcareous loam

Underlying layer:

35 to 52 inches - light yellowish brown, calcareous loam with relict redox features

52 to 80 inches - light yellowish brown and pale yellow, calcareous loam with redox concentrations and depletions

Ethan

Surface layer:

0 to 8 inches - grayish brown, calcareous loam

Subsoil:

8 to 20 inches - light yellowish brown, calcareous clay loam

20 to 35 inches - pale yellow, calcareous clay loam

Underlying layer:

35 to 68 inches - light yellowish brown, calcareous clay loam with relict redox features

68 to 80 inches - pale yellow, calcareous clay loam with relict redox features

Bonilla

Surface layer:

0 to 8 inches - dark gray loam

Subsoil:

- 8 to 18 inches - dark gray loam
- 18 to 27 inches - dark grayish brown loam
- 27 to 36 inches - light brownish gray, calcareous loam
- 36 to 47 inches - pale yellow, calcareous loam with redox concentrations and depletions

Underlying layer:

- 47 to 80 inches - pale yellow, calcareous loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Hand - well drained; Ethan - well drained; Bonilla - moderately well drained

Depth to restrictive feature: Hand - none; Ethan - none; Bonilla - none

Depth to contrasting parent material: Hand - greater than 60 inches;
Ethan - greater than 60 inches; Bonilla - greater than 60 inches

Depth to high water table: Hand - greater than 6 feet; Ethan - greater than 6 feet;
Bonilla - 3.5 to 5 feet

Flooding: Hand - none; Ethan - none; Bonilla - none

Ponding: Hand - none; Ethan - none; Bonilla - none

Permeability: Hand - moderate; Ethan - moderately slow; Bonilla - moderately slow

Available water capacity: Hand - high; Ethan - high; Bonilla - high

Organic matter content: Hand - moderate; Ethan - moderately low; Bonilla - high

Surface runoff: Hand - medium; Ethan - medium; Bonilla - medium

Other properties: Runoff water flows over the Bonilla soil during periods of rainfall or snowmelt.

Inclusions**Contrasting inclusions:**

- Somewhat poorly drained Crossplain soils on toeslopes
- Poorly drained Tetonka soils in basins

Similar inclusions:

- Soils that have more clay in the subsoil than the Hand soil
- Soils that have a thinner surface layer than the Ethan soil

Use and Management**Cropland**

- Main crops: Spring wheat, barley, alfalfa, corn, soybeans, and sunflowers
- Suitability for cropland: Fairly well suited

Management concerns:

- Hand - water erosion; Ethan - water and wind erosion, high content of lime adversely affects the availability of plant nutrients; Bonilla - water erosion

Management measures:

- Minimizing tillage and leaving crop residue on the surface help to control erosion and conserve moisture.
- Contour farming, terraces, and grassed waterways also help to control water erosion, but slopes in most areas are too short or too irregular for contouring or terracing.
- Applying animal wastes, especially on the Ethan soil, helps maintain fertility.
- Rotations including grasses and legumes help to control erosion, and maintain fertility, organic matter content, and tilth.

Interpretive Groups

Land capability classification: Hand - IIIe; Ethan - IVe; Bonilla - IIe

Ecological site: Hand - Loamy; Ethan - Thin Upland; Bonilla - Loamy

Conservation tree and shrub group: Hand - 3; Ethan - 8K; Bonilla - 1

Forage suitability group: Hand - Loam; Ethan - Limy Upland; Bonilla - Loam

HhB—Hand-Ethan-Carthage complex, 1 to 6 percent slopes

Composition

Hand and similar soils: 45 to 55 percent

Ethan and similar soils: 25 to 35 percent

Carthage and similar soils: 15 to 25 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Hand - summits and backslopes; Ethan - shoulders;
Carthage - footslopes

Slope range: Hand - 2 to 6 percent; Ethan - 2 to 6 percent; Carthage - 1 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Hand

Surface layer:

0 to 7 inches - dark gray fine sandy loam

Subsoil:

7 to 18 inches - grayish brown loam

18 to 35 inches - pale yellow, calcareous loam

Underlying layer:

35 to 52 inches - light yellowish brown, calcareous loam with relict redox features

52 to 80 inches - light yellowish brown and pale yellow, calcareous loam with redox concentrations and depletions

Ethan

Surface layer:

0 to 8 inches - grayish brown, calcareous loam

Subsoil:

8 to 20 inches - light yellowish brown, calcareous clay loam

20 to 35 inches - pale yellow, calcareous clay loam

Underlying layer:

35 to 68 inches - light yellowish brown, calcareous clay loam with relict redox features

68 to 80 inches - pale yellow, calcareous clay loam with relict redox features

Carthage

Surface layer:

0 to 16 inches - dark gray fine sandy loam

Subsoil:

16 to 24 inches - dark grayish brown fine sandy loam

Underlying layer:

24 to 43 inches - light brownish gray, calcareous loam with redox concentrations and depletions

43 to 80 inches - light gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Hand - well drained; Ethan - well drained; Carthage - moderately well drained

Depth to restrictive feature: Hand - none; Ethan - none; Carthage - none

Depth to contrasting parent material: Hand - greater than 60 inches; Ethan - greater than 60 inches; Carthage - 20 to 40 inches over glacial till

Depth to high water table: Hand - 4 to 6 feet; Ethan - greater than 6 feet; Carthage - 3 to 4 feet

Flooding: Hand - none; Ethan - none; Carthage - none

Ponding: Hand - none; Ethan - none; Carthage - none

Permeability: Hand - moderate; Ethan - moderately slow; Carthage - moderately rapid in the loamy sediments and moderately slow in the underlying glacial till

Available water capacity: Hand - high; Ethan - high; Carthage - moderate

Organic matter content: Hand - moderate; Ethan - moderately low; Carthage - moderate

Surface runoff: Hand - medium; Ethan - medium; Carthage - low

Inclusions

Contrasting inclusions:

Moderately well drained Forestburg soils which have more sand in the surface layer and subsoil than the Carthage soils on backslopes

Poorly drained Toko soils in basins

Similar inclusions:

Soils that have less sand in the surface layer than the Hand soil

Soils that have a greater depth to loamy glacial till than the Carthage soil

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Hand - water and wind erosion; Ethan - water and wind erosion, high content of lime adversely affects the availability of plant nutrients; Carthage - wind erosion, moderate available water capacity

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to control erosion and conserve moisture.

Wind stripcropping and field windbreaks also help to control wind erosion.

The Carthage soil is better suited to early-maturing crops such as small grains, except in years when a high water table is accessible by late-planted crops.

Applying animal wastes, especially on the Ethan soil, helps maintain fertility.

Interpretive Groups

Land capability classification: Hand - IIIe; Ethan - IIIe; Carthage - IIIe

Ecological site: Hand - Sandy; Ethan - Thin Upland; Carthage - Sandy

Conservation tree and shrub group: Hand - 3; Ethan - 8K; Carthage - 5

Forage suitability group: Hand - Loam; Ethan - Limy Upland; Carthage - Droughty Loam

HjB—Hand-Talmo complex, 2 to 6 percent slopes

Composition

Hand and similar soils: 40 to 50 percent

Talmo and similar soils: 30 to 40 percent

Contrasting inclusions: 15 to 25 percent

Setting

Landform: Till plains

Landform position: Hand - backslopes; Talmo - shoulders

Slope range: Hand - 2 to 6 percent; Talmo - 2 to 6 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Hand

Surface layer:

0 to 7 inches - dark gray loam

Subsoil:

7 to 18 inches - grayish brown loam

18 to 35 inches - pale yellow, calcareous loam

Underlying layer:

35 to 52 inches - light yellowish brown, calcareous loam with relict redox features

52 to 80 inches - light yellowish brown and pale yellow, calcareous loam with redox concentrations and depletions

Talmo

Surface layer:

0 to 7 inches - dark gray, calcareous, gravelly loam

Underlying layer:

7 to 58 inches - light yellowish brown, calcareous very gravelly loamy sand

58 to 80 inches - light yellowish brown, calcareous very gravelly sand

Soil Properties and Qualities

Drainage class: Hand - well drained; Talmo - excessively drained

Depth to restrictive feature: Hand - none; Talmo - strongly contrasting textural stratification-top depth ranges from 5 to 14 inches

Depth to contrasting parent material: Hand - greater than 60 inches; Talmo - 5 to 14 inches over gravelly material

Depth to high water table: Hand - 4 to 6 feet; Talmo - greater than 6 feet

Flooding: Hand - none; Talmo - none

Ponding: Hand - none; Talmo - none

Permeability: Hand - moderate; Talmo - very rapid

Available water capacity: Hand - high; Talmo - very low

Organic matter content: Hand - moderate; Talmo - moderately low

Surface runoff: Hand - medium; Talmo - very low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Blendon and moderately well drained Bonilla soils which are dark to a depth greater than 16 inches on footslopes

Somewhat excessively drained Delmont soils which have gravelly material at a depth of 14 to 20 inches on backslopes

Well drained Enet soils which have gravelly material at a depth of 20 to 40 inches on footslopes

Well drained Ethan soils which are calcareous to the surface and are not underlain with gravelly material on shoulders

Similar inclusions:

Soils that have less gravel in the surface layer than the Talmo soil

Use and Management

Cropland

Main crops: Hand - spring wheat, alfalfa, corn, sunflowers, and soybeans;

Talmo - unsuited

Suitability for cropland: Poorly suited

Management concerns:

Hand - water erosion; Talmo - water erosion, very low available water capacity

Management measures:

These soils are better suited to early-maturing crops such as small grains.

Minimizing tillage and leaving crop residue on the surface help to conserve moisture and control water erosion.

Rotations including grasses and legumes help to control water erosion and maintain organic matter content and tilth.

Timing nitrogen application close to the time crops will use it shortens the time available for leaching. Proper pesticide application is critical.

Interpretive Groups

Land capability classification: Hand - IIe; Talmo - VI

Ecological site: Hand - Loamy; Talmo - Very Shallow

Conservation tree and shrub group: Hand - 3; Talmo - 10

Forage suitability group: Hand - Loam; Talmo - Very Shallow to Gravel

HjC—Hand-Talmo complex, 6 to 9 percent slopes

Composition

Hand and similar soils: 40 to 50 percent

Talmo and similar soils: 30 to 40 percent

Contrasting inclusions: 15 to 25 percent

Setting

Landform: Moraines

Landform position: Hand - backslopes; Talmo - shoulders

Slope range: Hand - 6 to 9 percent; Talmo - 6 to 9 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Hand

Surface layer:

0 to 7 inches - dark gray loam

Subsoil:

7 to 18 inches - grayish brown loam

18 to 35 inches - pale yellow, calcareous loam

Underlying layer:

35 to 52 inches - light yellowish brown, calcareous loam with relict redox features

52 to 80 inches - light yellowish brown and pale yellow, calcareous loam with redox concentrations and depletions

Talmo

Surface layer:

0 to 7 inches - dark gray, calcareous gravelly loam

Underlying layer:

7 to 58 inches - light yellowish brown, calcareous very gravelly loamy sand

58 to 80 inches - light yellowish brown, calcareous very gravelly sand

Soil Properties and Qualities

Drainage class: Hand - well drained; Talmo - excessively drained

Depth to restrictive feature: Hand - none; Talmo - strongly contrasting textural stratification-top depth ranges from 5 to 14 inches

Depth to contrasting parent material: Hand - greater than 60 inches; Talmo - 5 to 14 inches over gravelly material

Depth to high water table: Hand - greater than 6 feet; Talmo - greater than 6 feet

Flooding: Hand - none; Talmo - none

Ponding: Hand - none; Talmo - none

Permeability: Hand - moderate; Talmo - very rapid

Available water capacity: Hand - high; Talmo - very low

Organic matter content: Hand - moderate; Talmo - moderately low

Surface runoff: Hand - medium; Talmo - low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Blendon and moderately well drained Bonilla soils which are dark to a depth greater than 16 inches on footslopes

Somewhat excessively drained Delmont soils which have gravelly material at a depth of 14 to 20 inches on backslopes

Well drained Enet soils which have gravelly material at a depth of 20 to 40 inches on footslopes

Well drained Ethan soils which are calcareous to the surface and are not underlain with gravelly material on shoulders

Similar inclusions:

Soils that have less gravel in the surface layer than the Talmo soil

Use and Management

Cropland

Main crops: Hand - spring wheat, alfalfa, corn, sunflowers, and soybeans;

Talmo - unsuited

Suitability for cropland: Poorly suited

Management concerns:

Hand - water erosion; Talmo - water erosion, very low available water capacity

Management measures:

These soils are better suited to early-maturing crops such as small grains.

Minimizing tillage and leaving crop residue on the surface help to conserve moisture and control water erosion.

Rotations including grasses and legumes help to control water erosion and maintain organic matter content and tilth.

Timing nitrogen application close to the time crops will use it shortens the time available for leaching. Proper pesticide application is critical.

Interpretive Groups

Land capability classification: Hand - IIIe; Talmo - VIs

Ecological site: Hand - Loamy; Talmo - Very Shallow

Conservation tree and shrub group: Hand - 3; Talmo - 10

Forage suitability group: Hand - Loam; Talmo - Not Suited

Hk—Harmony-Aberdeen silt loams, till substratum, 0 to 2 percent slopes

Composition

Harmony and similar soils: 50 to 60 percent

Aberdeen and similar soils: 25 to 40 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Harmony - summits and backslopes; Aberdeen - footslopes

Slope range: Harmony - 0 to 2 percent; Aberdeen - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 20 to 200 acres

Typical Profile**Harmony****Surface layer:**

0 to 8 inches - dark gray silt loam

Subsoil:

8 to 14 inches - gray silty clay

14 to 22 inches - grayish brown silty clay loam

22 to 34 inches - light gray, calcareous silty clay loam

Underlying layer:

34 to 50 inches - pale yellow, calcareous, varved silty clay loam with redox concentrations

50 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Aberdeen**Surface layer:**

0 to 6 inches - dark gray silt loam

Transitional layer:

6 to 11 inches - gray silty clay loam

Subsoil:

11 to 17 inches - dark gray silty clay

17 to 23 inches - grayish brown silty clay

23 to 36 inches - light gray, calcareous silty clay loam

Underlying layer:

36 to 49 inches - pale yellow, calcareous, varved silty clay loam

49 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Harmony - moderately well drained; Aberdeen - moderately well drained

Depth to restrictive feature: Harmony - none; Aberdeen - none

Depth to contrasting parent material: Harmony - greater than 40 inches over glacial till; Aberdeen - greater than 40 inches over glacial till

Depth to high water table: Harmony - 3.5 to 5 feet; Aberdeen - 3.5 to 5 feet

Flooding: Harmony - none; Aberdeen - none

Ponding: Harmony - none; Aberdeen - none

Permeability: Harmony - moderately slow in the solum and moderate to slow in the underlying material; Aberdeen - slow

Available water capacity: Harmony - high; Aberdeen - high

Organic matter content: Harmony - high; Aberdeen - moderate

Surface runoff: Harmony - low; Aberdeen - low

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Well drained Beotia soils which have more silt and less clay in the subsoil than the Harmony soil on lower backslopes

Moderately well drained Nahon soils which have more exchangeable sodium in the subsoil than the Aberdeen soil on lower footslopes

Poorly drained Tonka soils in basins

Similar inclusions:

Soils that are less than 40 inches to loamy glacial till

Soils that are greater than 60 inches to loamy glacial till

Use and Management**Cropland**

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Harmony - few limitations except to conserve moisture; Aberdeen - slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.

Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Harmony - IIc; Aberdeen - IIIs

Ecological site: Harmony - Clayey; Aberdeen - Clayey

Conservation tree and shrub group: Harmony - 4; Aberdeen - 4

Forage suitability group: Harmony - Clayey Subsoil; Aberdeen - Clayey Subsoil

Hm—Harmony-Aberdeen silty clay loams, 0 to 2 percent slopes

Composition

Harmony and similar soils: 50 to 60 percent

Aberdeen and similar soils: 25 to 40 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Harmony - summits and backslopes; Aberdeen - footslopes

Slope range: Harmony - 0 to 2 percent; Aberdeen - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Harmony

Surface layer:

0 to 7 inches - dark gray silty clay loam

Subsurface layer:

7 to 11 inches - dark gray silty clay loam

Subsoil:

11 to 16 inches - gray silty clay loam

16 to 25 inches - grayish brown silty clay loam

25 to 34 inches - light gray, calcareous silty clay loam

Underlying layer:

34 to 56 inches - pale yellow, calcareous, varved silty clay loam with redox concentrations

56 to 80 inches - light yellowish brown, calcareous, varved silt loam with redox concentrations and depletions

Aberdeen

Surface layer:

0 to 8 inches - dark gray silty clay loam

Transitional layer:

8 to 13 inches - gray silty clay loam

Subsoil:

13 to 23 inches - dark gray silty clay

23 to 31 inches - grayish brown, calcareous silty clay loam with masses of salt and crystals of gypsum

31 to 39 inches - light brownish gray, calcareous silty clay loam with masses of salt and crystals of gypsum

Underlying layer:

39 to 80 inches - pale yellow, calcareous, varved silty clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Harmony - moderately well drained; Aberdeen - moderately well drained

Depth to restrictive feature: Harmony - none; Aberdeen - none

Depth to contrasting parent material: Harmony - greater than 60 inches; Aberdeen - greater than 60 inches

Depth to high water table: Harmony - 3.5 to 5 feet; Aberdeen - 3.5 to 5 feet

Flooding: Harmony - none; Aberdeen - none

Ponding: Harmony - none; Aberdeen - none

Permeability: Harmony - moderately slow in the solum and moderate to slow in the underlying material; Aberdeen - slow

Available water capacity: Harmony - high; Aberdeen - high

Organic matter content: Harmony - high; Aberdeen - moderate

Surface runoff: Harmony - low; Aberdeen - low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Beotia soils which have more silt and less clay in the subsoil than the Harmony soil on lower backslopes

Moderately well drained Nahon soils which have more exchangeable sodium in the subsoil than the Aberdeen soil on lower footslopes

Poorly drained Tonka soils in basins

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Harmony - few limitations except to conserve moisture; Aberdeen - slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.

Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Harmony - IIc; Aberdeen - IIIs

Ecological site: Harmony - Clayey; Aberdeen - Clayey

Conservation tree and shrub group: Harmony - 4; Aberdeen - 4

Forage suitability group: Harmony - Clayey Subsoil; Aberdeen - Clayey Subsoil

Hn—Harmony-Beotia silt loams, 0 to 2 percent slopes

Composition

Harmony and similar soils: 45 to 60 percent

Beotia and similar soils: 30 to 45 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Harmony - footslopes; Beotia - footslopes

Slope range: Harmony - 0 to 2 percent; Beotia - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Harmony

Surface layer:

0 to 7 inches - dark gray silt loam

Subsurface layer:

7 to 11 inches - dark gray silty clay loam

Subsoil:

11 to 16 inches - gray silty clay loam

16 to 25 inches - grayish brown silty clay loam

25 to 34 inches - light gray, calcareous silty clay loam

Underlying layer:

34 to 56 inches - pale yellow, calcareous, varved silty clay loam with redox concentrations

56 to 80 inches - light yellowish brown, calcareous, varved silt loam with redox concentrations and depletions

Beotia

Surface layer:

0 to 9 inches - dark gray silt loam

Subsoil:

9 to 17 inches - dark grayish brown silty clay loam

17 to 21 inches - light olive brown silt loam

21 to 39 inches - pale yellow, calcareous silt loam

Underlying layer:

39 to 80 inches - pale yellow, calcareous, varved silty clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Harmony - moderately well drained; Beotia - well drained

Depth to restrictive feature: Harmony - none; Beotia - none

Depth to contrasting parent material: Harmony - greater than 60 inches;
Beotia - greater than 60 inches

Depth to high water table: Harmony - 3.5 to 5 feet; Beotia - 4 to 6 feet

Flooding: Harmony - none; Beotia - none

Ponding: Harmony - none; Beotia - none

Permeability: Harmony - moderately slow in the solum and moderate to slow in the underlying material; Beotia - moderate in the solum and moderate to slow in the underlying material

Available water capacity: Harmony - high; Beotia - high

Organic matter content: Harmony - high; Beotia - high

Surface runoff: Harmony - low; Beotia - low

Inclusions

Contrasting inclusions: (May have significant management concerns)

- Moderately well drained Aberdeen soils which have a sodium-affected subsoil on footslopes
- Well drained Great Bend soils which are dark to a depth less than 16 inches on backslopes
- Poorly drained Tonka soils in basins

Use and Management

Cropland

- Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers
- Suitability for cropland: Well suited

Management concerns:

- Few limitations except to conserve moisture

Management measures:

- Minimizing tillage and leaving crop residue on the surface help to conserve moisture.

Interpretive Groups

Land capability classification: Harmony - IIc; Beotia - IIc

Ecological site: Harmony - Clayey; Beotia - Loamy

Conservation tree and shrub group: Harmony - 4; Beotia - 1

Forage suitability group: Harmony - Clayey Subsoil; Beotia - Loam

Ho—Harmony-Beotia silt loams, till substratum, 0 to 2 percent slopes

Composition

- Harmony and similar soils: 45 to 60 percent
- Beotia and similar soils: 30 to 45 percent
- Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Harmony - footslopes; Beotia - footslopes

Slope range: Harmony - 0 to 2 percent; Beotia - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Harmony

Surface layer:

- 0 to 8 inches - dark gray silt loam

Subsoil:

- 8 to 14 inches - gray silty clay
- 14 to 22 inches - grayish brown silty clay loam
- 22 to 34 inches - light gray, calcareous silty clay loam

Underlying layer:

- 34 to 50 inches - pale yellow, calcareous, varved silty clay loam with redox concentrations
- 50 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Beotia**Surface layer:**

- 0 to 12 inches - dark gray silt loam

Subsoil:

- 12 to 18 inches - dark gray silty clay loam
- 18 to 27 inches - grayish brown silty clay loam
- 27 to 39 inches - light gray, calcareous silt loam
- 39 to 46 inches - pale yellow, calcareous silt loam

Underlying layer:

- 46 to 52 inches - light yellowish brown, calcareous, varved silt loam with redox concentrations and depletions
- 52 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Harmony - moderately well drained; Beotia - well drained

Depth to restrictive feature: Harmony - none; Beotia - none

Depth to contrasting parent material: Harmony - greater than 40 inches over glacial till; Beotia - greater than 40 inches over glacial till

Depth to high water table: Harmony - 3.5 to 5 feet; Beotia - 4 to 6 feet

Flooding: Harmony - none; Beotia - none

Ponding: Harmony - none; Beotia - none

Permeability: Harmony - moderately slow in the solum and moderate to slow in the underlying material; Beotia - moderate in the solum and moderate to slow in the underlying material

Available water capacity: Harmony - high; Beotia - high

Organic matter content: Harmony - high; Beotia - high

Surface runoff: Harmony - low; Beotia - low

Inclusions**Contrasting inclusions: (May have significant management concerns)**

- Moderately well drained Aberdeen soils which have a sodium-affected subsoil on footslopes
- Well drained Great Bend soils which are dark to a depth less than 16 inches on backslopes
- Poorly drained Tonka soils in basins

Similar inclusions:

- Soils that are less than 40 inches to loamy glacial till
- Soils that are greater than 60 inches to loamy glacial till

Use and Management**Cropland**

- Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers
- Suitability for cropland: Well suited

Management concerns:

- Few limitations except to conserve moisture

Management measures:

Minimizing tillage and leaving crop residue on the surface help to conserve moisture.

Interpretive Groups

Land capability classification: Harmony - IIc; Beotia - IIc

Ecological site: Harmony - Clayey; Beotia - Loamy

Conservation tree and shrub group: Harmony - 4; Beotia - 1

Forage suitability group: Harmony - Clayey Subsoil; Beotia - Loam

Hp—Harriet loam, 0 to 1 percent slopes**Composition**

Harriet and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Flood plains

Landform position: Low flood plains

Slope range: 0 to 1 percent

Shape of areas: Long and narrow

Size of areas: 5 to 100 acres

Typical Profile**Surface layer:**

0 to 2 inches - gray loam

Subsoil:

2 to 8 inches - dark gray silty clay loam

8 to 17 inches - gray, calcareous silty clay loam with masses of salt and nests of gypsum

17 to 34 inches - olive gray and light olive gray, calcareous silty clay loam with masses of salt and nests of gypsum

34 to 42 inches - light gray, calcareous silty clay loam with masses of salt and nests of gypsum

Underlying layer:

42 to 51 inches - light yellowish brown, calcareous sandy loam with redox concentrations

51 to 80 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Poorly drained

Depth to restrictive feature: Natric; top depth ranges from 0 to 5 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: 0 to 1 foot

Flooding: Occasional for long periods

Ponding: None

Permeability: Very slow

Available water capacity: Moderate

Organic matter content: Moderately low

Surface runoff: Very low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Poorly drained Playmoor soils which do not have a sodium-affected subsoil on low flood plains

Somewhat poorly drained Ranslo soils which have more exchangeable sodium in the subsoil and have a thicker surface layer on high flood plains

Use and Management

Rangeland

Main crops: Unsited

Suitability for cropland: Unsited

Management concerns:

Flooding, high water table, sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability

Management measures:

Proper grazing management helps to maintain plant vigor.

Defer haying or grazing during wet periods.

Seed cultivated areas to adapted grasses.

Interpretive Groups

Land capability classification: VIs

Ecological site: Saline Lowland

Conservation tree and shrub group: 10

Forage suitability group: Not Suited

Hr—Heil silt loam, 0 to 1 percent slopes

Composition

Heil and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains and lake plains

Landform position: Basins

Slope range: 0 to 1 percent

Shape of areas: Oval

Size of areas: 5 to 50 acres

Typical Profile

Surface layer:

0 to 2 inches - gray, silt loam with redox concentrations

Subsoil:

2 to 24 inches - dark gray silty clay with masses of salt and crystals of gypsum in the lower part

24 to 39 inches - gray, calcareous silty clay loam with masses of salt and crystals of gypsum

39 to 47 inches - light brownish gray, calcareous silty clay loam with masses of salt, crystals of gypsum, and redox concentrations and depletions

Underlying layer:

47 to 80 inches - pale olive, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Poorly drained

Depth to restrictive feature: Natric; top depth ranges from 1 to 4 inches

Depth to contrasting parent material: Greater than 40 inches over glacial till

Depth to high water table: Plus 1 to 1.5 feet

Flooding: None

Ponding: Frequent for long periods

Permeability: Very slow

Available water capacity: Moderate

Organic matter content: Moderate

Surface runoff: Negligible

Inclusions

Contrasting inclusions: (May have significant management concerns)

Poorly drained Rimlap soils which do not have a sodium-affected subsoil and have a thicker surface layer in the center around the edges of the basins

Poorly drained Tonka soils which do not have a sodium-affected subsoil and have a thicker surface layer than the Heil and Rimlap soils in the center of the basins

Use and Management

Rangeland

Main crops: Unsited

Suitability for cropland: Unsited

Management concerns:

Ponding, high water table, sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability

Management measures:

Proper grazing management helps to maintain plant vigor.

Restricting grazing during wet periods helps to limit compaction.

Interpretive Groups

Land capability classification: VIs

Ecological site: Closed Depression

Conservation tree and shrub group: 10

Forage suitability group: Not Suited

HsA—Henkin-Blendon fine sandy loams, 0 to 2 percent slopes

Composition

Henkin and similar soils: 45 to 60 percent

Blendon and similar soils: 30 to 45 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Outwash plains

Landform position: Henkin - summits and backslopes; Blendon - footslopes

Slope range: Henkin - 0 to 2 percent; Blendon - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Henkin

Surface layer:

0 to 7 inches - dark gray fine sandy loam

Subsoil:

7 to 15 inches - dark grayish brown fine sandy loam

15 to 35 inches - brown fine sandy loam

35 to 46 inches - light yellowish brown, calcareous sandy loam

Underlying layer:

46 to 65 inches - pale yellow, calcareous loamy sand

65 to 80 inches - light yellowish brown, calcareous loamy sand

Blendon

Surface layer:

0 to 6 inches - dark gray fine sandy loam

Subsurface layer:

6 to 9 inches - dark grayish brown fine sandy loam

Subsoil:

9 to 20 inches - brown loam

20 to 36 inches - brown fine sandy loam

36 to 48 inches - light olive brown fine sandy loam

Underlying layer:

48 to 80 inches - light yellowish brown, calcareous loamy sand

Soil Properties and Qualities

Drainage class: Henkin - well drained; Blendon - well drained

Depth to restrictive feature: Henkin - none; Blendon - none

Depth to contrasting parent material: Henkin - greater than 60 inches;
Blendon - greater than 60 inches

Depth to high water table: Henkin - greater than 6 feet; Blendon - 4 to 6 feet

Flooding: Henkin - none; Blendon - none

Ponding: Henkin - none; Blendon - none

Permeability: Henkin - moderately rapid; Blendon - moderately rapid

Available water capacity: Henkin - moderate; Blendon - moderate

Organic matter content: Henkin - moderate; Blendon - moderate

Surface runoff: Henkin - low; Blendon - low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Enet soils which have gravelly material at a depth of 20 to 40 inches on footslopes

Moderately well drained Woonsocket soils which have a sodium-affected subsoil on footslopes

Similar inclusions:

Soils that have glacial till within a depth of 40 inches

Use and Management

Cropland

Main crops: Spring wheat, alfalfa, corn, soybeans, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Wind erosion, moderate available water capacity, agrochemical leaching

Management measures:

These soils are better suited to early-maturing crops such as small grains.

Minimizing tillage and leaving crop residue on the surface help to control wind erosion and conserve moisture.

Wind stripcropping and field windbreaks also help to control wind erosion.

Timing nitrogen application close to the time crops will use it shortens the time available for leaching. Proper pesticide application is critical.

Interpretive Groups

Land capability classification: Henkin - IIIe; Blendon - IIIe

Ecological site: Henkin - Sandy; Blendon - Sandy

Conservation tree and shrub group: Henkin - 5; Blendon - 5

Forage suitability group: Henkin - Droughty Loam; Blendon - Droughty Loam

HsB—Henkin-Blendon fine sandy loams, 2 to 6 percent slopes**Composition**

Henkin and similar soils: 45 to 65 percent

Blendon and similar soils: 25 to 40 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Outwash plains

Landform position: Henkin - summits and backslopes; Blendon - footslopes

Slope range: Henkin - 2 to 6 percent; Blendon - 2 to 6 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile**Henkin****Surface layer:**

0 to 7 inches - dark gray fine sandy loam

Subsoil:

7 to 15 inches - dark grayish brown fine sandy loam

15 to 35 inches - brown fine sandy loam

35 to 46 inches - light yellowish brown, calcareous sandy loam

Underlying layer:

46 to 65 inches - pale yellow, calcareous loamy sand

65 to 80 inches - light yellowish brown, calcareous loamy sand

Blendon**Surface layer:**

0 to 6 inches - dark gray fine sandy loam

Subsurface layer:

6 to 9 inches - dark grayish brown fine sandy loam

Subsoil:

- 9 to 20 inches - brown loam
- 20 to 36 inches - brown fine sandy loam
- 36 to 48 inches - light olive brown fine sandy loam

Underlying layer:

- 48 to 80 inches - light yellowish brown, calcareous loamy sand

Soil Properties and Qualities

Drainage class: Henkin - well drained; Blendon - well drained

Depth to restrictive feature: Henkin - none; Blendon - none

Depth to contrasting parent material: Henkin - greater than 60 inches;
Blendon - greater than 60 inches

Depth to high water table: Henkin - greater than 6 feet; Blendon - 4 to 6 feet

Flooding: Henkin - none; Blendon - none

Ponding: Henkin - none; Blendon - none

Permeability: Henkin - moderately rapid; Blendon - moderately rapid

Available water capacity: Henkin - moderate; Blendon - moderate

Organic matter content: Henkin - moderate; Blendon - moderate

Surface runoff: Henkin - medium; Blendon - medium

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Well drained Enet soils which have gravelly material at a depth of 20 to 40 inches on footslopes

Moderately well drained Woonsocket soils which have a sodium-affected subsoil on footslopes

Similar inclusions:

Soils that have glacial till within a depth of 40 inches

Use and Management**Cropland**

Main crops: Spring wheat, alfalfa, corn, soybeans, and sunflowers

Suitability for cropland: Poorly suited

Management concerns:

Water erosion, wind erosion, moderate available water capacity, agrochemical leaching

Management measures:

Soils are better suited to early-maturing crops such as small grains.

Minimizing tillage and leaving crop residue on the surface help to control erosion and conserve moisture.

Wind stripcropping and field windbreaks also help to control wind erosion.

Timing nitrogen application close to the time crops will use it shortens the time available for leaching. Proper pesticide application is critical.

Interpretive Groups

Land capability classification: Henkin - IIIe; Blendon - IIIe

Ecological site: Henkin - Sandy; Blendon - Sandy

Conservation tree and shrub group: Henkin - 5; Blendon - 5

Forage suitability group: Henkin - Droughty Loam; Blendon - Droughty Loam

HtB—Houdek-Ethan-Prosper loams, 1 to 6 percent slopes

Composition

Houdek and similar soils: 40 to 55 percent

Ethan and similar soils: 25 to 35 percent

Prosper and similar soils: 15 to 25 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Houdek - summits and backslopes; Ethan - shoulders;
Prosper - footslopes

Slope range: Houdek - 2 to 6 percent; Ethan - 2 to 6 percent; Prosper - 1 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Houdek

Surface layer:

0 to 6 inches - dark gray loam

Subsoil:

6 to 11 inches - dark grayish brown clay loam

11 to 19 inches - grayish brown clay loam

19 to 42 inches - light yellowish brown, calcareous clay loam

Underlying layer:

42 to 63 inches - grayish brown, calcareous clay loam with relict redox features

63 to 80 inches - grayish brown, calcareous clay loam with redox concentrations and depletions

Ethan

Surface layer:

0 to 8 inches - grayish brown, calcareous loam

Subsoil:

8 to 20 inches - light yellowish brown, calcareous clay loam

20 to 35 inches - pale yellow, calcareous clay loam

Underlying layer:

35 to 68 inches - light yellowish brown, calcareous clay loam with relict redox features

68 to 80 inches - pale yellow, calcareous clay loam with relict redox features

Prosper

Surface layer:

0 to 8 inches - dark gray loam

Subsoil:

8 to 20 inches - very dark grayish brown clay loam

20 to 30 inches - dark grayish brown clay loam

30 to 39 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Underlying layer:

39 to 56 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

56 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Houdek - well drained; Ethan - well drained; Prosper - moderately well drained

Depth to restrictive feature: Houdek - none; Ethan - none; Prosper - none

Depth to contrasting parent material: Houdek - greater than 60 inches; Ethan - greater than 60 inches; Prosper - greater than 60 inches

Depth to high water table: Houdek - 4 to 6 feet; Ethan - greater than 6 feet; Prosper - 3.5 to 5 feet

Flooding: Houdek - none; Ethan - none; Prosper - none

Ponding: Houdek - none; Ethan - none; Prosper - none

Permeability: Houdek - moderately slow; Ethan - moderately slow; Prosper - moderately slow

Available water capacity: Houdek - high; Ethan - high; Prosper - high

Organic matter content: Houdek - moderate; Ethan - moderately low; Prosper - high

Surface runoff: Houdek - medium; Ethan - medium; Prosper - low

Other properties: Runoff water flows over the Prosper soil during periods of rainfall or snowmelt.

Inclusions**Contrasting inclusions:**

Somewhat poorly drained Crossplain soils on toeslopes

Moderately well drained Stickney soils which have a sodium-affected subsoil on footslopes

Poorly drained Tetonka soils in basins

Use and Management**Cropland**

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Houdek - water erosion; Ethan - water and wind erosion, high content of lime adversely affects the availability of plant nutrients; Prosper - few limitations except to conserve moisture

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control erosion and conserve moisture.

Contour farming and grassed waterways also help to control water erosion, but slopes in most areas are too short or too irregular for contouring.

Applying animal wastes, especially on the Ethan soil, helps maintain fertility.

Rotations including grasses and legumes help to control erosion and maintain fertility, organic matter content, and tilth.

Interpretive Groups

Land capability classification: Houdek - IIe; Ethan - IIIe; Prosper - IIc

Ecological site: Houdek - Loamy; Ethan - Thin Upland; Prosper - Loamy Overflow

Conservation tree and shrub group: Houdek - 3; Ethan - 8K; Prosper - 1

Forage suitability group: Houdek - Loam; Ethan - Limy Upland; Prosper - Overflow

HtC—Houdek-Ethan-Prosper loams, 2 to 9 percent slopes

Composition

Houdek and similar soils: 40 to 50 percent

Ethan and similar soils: 25 to 40 percent

Prosper and similar soils: 15 to 25 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Houdek - backslopes; Ethan - shoulders; Prosper - footslopes

Slope range: Houdek - 6 to 9 percent; Ethan - 6 to 9 percent; Prosper - 2 to 6 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Houdek

Surface layer:

0 to 6 inches - dark gray loam

Subsoil:

6 to 11 inches - dark grayish brown clay loam

11 to 19 inches - grayish brown clay loam

19 to 42 inches - light yellowish brown, calcareous clay loam

Underlying layer:

42 to 63 inches - grayish brown, calcareous clay loam with relict redox features

63 to 80 inches - grayish brown, calcareous clay loam with redox concentrations and depletions

Ethan

Surface layer:

0 to 8 inches - grayish brown, calcareous loam

Subsoil:

8 to 20 inches - light yellowish brown, calcareous clay loam

20 to 35 inches - pale yellow, calcareous clay loam

Underlying layer:

35 to 68 inches - light yellowish brown, calcareous clay loam with relict redox features

68 to 80 inches - pale yellow, calcareous clay loam with relict redox features

Prosper

Surface layer:

0 to 8 inches - dark gray loam

Subsoil:

8 to 20 inches - very dark grayish brown clay loam

20 to 30 inches - dark grayish brown clay loam

30 to 39 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Underlying layer:

39 to 56 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

56 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Houdek - well drained; Ethan - well drained; Prosper - moderately well drained

Depth to restrictive feature: Houdek - none; Ethan - none; Prosper - none

Depth to contrasting parent material: Houdek - greater than 60 inches;

Ethan - greater than 60 inches; Prosper - greater than 60 inches

Depth to high water table: Houdek - greater than 6 feet; Ethan - greater than 6 feet; Prosper - 3.5 to 5 feet

Flooding: Houdek - none; Ethan - none; Prosper - none

Ponding: Houdek - none; Ethan - none; Prosper - none

Permeability: Houdek - moderately slow; Ethan - moderately slow; Prosper - moderately slow

Available water capacity: Houdek - high; Ethan - high; Prosper - high

Organic matter content: Houdek - moderate; Ethan - moderately low; Prosper - high

Surface runoff: Houdek - medium; Ethan - medium; Prosper - medium

Other properties: Runoff water flows over the Prosper soil during periods of rainfall or snowmelt.

Inclusions**Contrasting inclusions:**

Somewhat poorly drained Crossplain soils on toeslopes

Poorly drained Tetonka soils in basins

Similar inclusions:

Soils that have a thinner surface layer than the Ethan soil

Use and Management**Cropland**

Main crops: Spring wheat, barley, alfalfa, corn, soybeans, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Houdek - water erosion; Ethan - water and wind erosion, high content of lime adversely affects the availability of plant nutrients; Prosper - water erosion

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control erosion and conserve moisture.

Contour farming, terraces, and grassed waterways also help to control water erosion, but slopes in most areas are too short or too irregular for contouring and terracing.

Applying animal wastes, especially on the Ethan soil, helps maintain fertility.

Rotations including grasses and legumes help to control erosion and maintain fertility, organic matter content, and tilth.

Interpretive Groups

Land capability classification: Houdek - IIIe; Ethan - IVe; Prosper - IIe

Ecological site: Houdek - Loamy; Ethan - Thin Upland; Prosper - Loamy

Conservation tree and shrub group: Houdek - 3; Ethan - 8K; Prosper - 1

Forage suitability group: Houdek - Loam; Ethan - Limy Upland; Prosper - Loam

HuA—Houdek-Prosper loams, 0 to 2 percent slopes**Composition**

Houdek and similar soils: 45 to 55 percent

Prosper and similar soils: 35 to 45 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Houdek - summits and backslopes; Prosper - footslopes

Slope range: Houdek - 0 to 2 percent; Prosper - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile**Houdek****Surface layer:**

0 to 6 inches - dark gray loam

Subsoil:

6 to 11 inches - dark grayish brown clay loam

11 to 19 inches - grayish brown clay loam

19 to 42 inches - light yellowish brown, calcareous clay loam

Underlying layer:

42 to 63 inches - grayish brown, calcareous clay loam with relict redox features

63 to 80 inches - grayish brown, calcareous clay loam with redox concentrations and depletions

Prosper**Surface layer:**

0 to 8 inches - dark gray loam

Subsoil:

8 to 20 inches - very dark grayish brown clay loam

20 to 30 inches - dark grayish brown clay loam

30 to 39 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Underlying layer:

39 to 56 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

56 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Houdek - well drained; Prosper - moderately well drained

Depth to restrictive feature: Houdek - none; Prosper - none

Depth to contrasting parent material: Houdek - greater than 60 inches;
Prosper - greater than 60 inches

Depth to high water table: Houdek - 4 to 6 feet; Prosper - 3.5 to 5 feet

Flooding: Houdek - none; Prosper - none

Ponding: Houdek - none; Prosper - none

Permeability: Houdek - moderately slow; Prosper - moderately slow

Available water capacity: Houdek - high; Prosper - high

Organic matter content: Houdek - moderate; Prosper - high

Surface runoff: Houdek - low; Prosper - low

Other properties: Runoff water flows over the Prosper soil during periods of rainfall or snowmelt.

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Stickney soils which have a sodium-affected subsoil on footslopes

Poorly drained Tetonka soils in basins

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Well suited

Management concerns:

Few limitations except to conserve moisture

Management measures:

Managing tillage and leaving crop residue conserves moisture and helps to maintain organic matter content and tilth.

Interpretive Groups

Land capability classification: Houdek - IIc; Prosper - IIc

Ecological site: Houdek - Loamy; Prosper - Loamy Overflow

Conservation tree and shrub group: Houdek - 3; Prosper - 1

Forage suitability group: Houdek - Loam; Prosper - Overflow

HuB—Houdek-Prosper loams, 1 to 6 percent slopes

Composition

Houdek and similar soils: 50 to 65 percent

Prosper and similar soils: 25 to 40 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Houdek - summits and backslopes; Prosper - footslopes

Slope range: Houdek - 2 to 6 percent; Prosper - 1 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Houdek

Surface layer:

0 to 6 inches - dark gray loam

Subsoil:

6 to 11 inches - dark grayish brown clay loam

11 to 19 inches - grayish brown clay loam

19 to 42 inches - light yellowish brown, calcareous clay loam

Underlying layer:

- 42 to 63 inches - grayish brown, calcareous clay loam with relict redox features
- 63 to 80 inches - grayish brown, calcareous clay loam with redox concentrations and depletions

Prosper**Surface layer:**

- 0 to 8 inches - dark gray loam

Subsoil:

- 8 to 20 inches - very dark grayish brown clay loam
- 20 to 30 inches - dark grayish brown clay loam
- 30 to 39 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Underlying layer:

- 39 to 56 inches - pale yellow, calcareous clay loam with redox concentrations and depletions
- 56 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Houdek - well drained; Prosper - moderately well drained

Depth to restrictive feature: Houdek - none; Prosper - none

Depth to contrasting parent material: Houdek - greater than 60 inches;
Prosper - greater than 60 inches

Depth to high water table: Houdek - 4 to 6 feet; Prosper - 3.5 to 5 feet

Flooding: Houdek - none; Prosper - none

Ponding: Houdek - none; Prosper - none

Permeability: Houdek - moderately slow; Prosper - moderately slow

Available water capacity: Houdek - high; Prosper - high

Organic matter content: Houdek - moderate; Prosper - high

Surface runoff: Houdek - medium; Prosper - low

Other properties: Runoff water flows over the Prosper soil during periods of rainfall or snowmelt.

Inclusions**Contrasting inclusions: (May have significant management concerns)**

- Well drained Ethan soils which are calcareous to the surface on shoulders
- Moderately well drained Stickney soils which have a sodium-affected subsoil on footslopes
- Poorly drained Tetonka soils in basins

Use and Management**Cropland**

- Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers
- Suitability for cropland: Well suited

Management concerns:

- Houdek - water erosion; Prosper - few limitations except to conserve moisture

Management measures:

- Minimizing tillage and leaving crop residue on the surface help to control water erosion and conserve moisture.
- Contour farming and grassed waterways help to control water erosion, but slopes in most areas are too short or too irregular for contouring.

Interpretive Groups

Land capability classification: Houdek - IIe; Prosper - IIc

Ecological site: Houdek - Loamy; Prosper - Loamy Overflow

Conservation tree and shrub group: Houdek - 3; Prosper - 1

Forage suitability group: Houdek - Loam; Prosper - Overflow

HwA—Houdek-Stickney complex, 0 to 2 percent slopes

Composition

Houdek and similar soils: 50 to 60 percent

Stickney and similar soils: 25 to 40 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Houdek - summits and backslopes; Stickney - footslopes

Slope range: Houdek - 0 to 2 percent; Stickney - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 20 to 400 acres

Typical Profile

Houdek

Surface layer:

0 to 6 inches - dark gray loam

Subsoil:

6 to 11 inches - dark grayish brown clay loam

11 to 19 inches - grayish brown clay loam

19 to 42 inches - light yellowish brown, calcareous clay loam

Underlying layer:

42 to 63 inches - grayish brown, calcareous clay loam with relict redox features

63 to 80 inches - grayish brown, calcareous clay loam with redox concentrations and depletions

Stickney

Surface layer:

0 to 7 inches - dark gray silt loam

Subsurface layer:

7 to 10 inches - gray silt loam

Transitional layer:

10 to 13 inches - dark grayish brown and gray silty clay loam

Subsoil:

13 to 22 inches - dark grayish brown clay loam

22 to 40 inches - light brownish gray, calcareous clay loam

Underlying layer:

40 to 80 inches - grayish brown, calcareous clay loam

Soil Properties and Qualities

Drainage class: Houdek - well drained; Stickney - moderately well drained

Depth to restrictive feature: Houdek - none; Stickney - none

Depth to contrasting parent material: Houdek - greater than 60 inches;

Stickney - greater than 60 inches

Depth to high water table: Houdek - 4 to 6 feet; Stickney - 3.5 to 5 feet

Flooding: Houdek - none; Stickney - none

Ponding: Houdek - none; Stickney - none

Permeability: Houdek - moderately slow; Stickney - slow

Available water capacity: Houdek - high; Stickney - high

Organic matter content: Houdek - moderate; Stickney - moderate

Surface runoff: Houdek - low; Stickney - low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Dudley soils which have more exchangeable sodium in the subsoil than the Stickney soil on lower footslopes

Moderately well drained Prosper soils which do not have a sodium-affected subsoil and are dark to a depth greater than 20 inches on footslopes

Poorly drained Tetonka soils in basins

Similar inclusions:

Soils that have more clay in the subsoil than the Houdek soil

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Houdek - few limitations except to conserve moisture; Stickney - sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.

Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Houdek - IIc; Stickney - IIIs

Ecological site: Houdek - Loamy; Stickney - Clayey

Conservation tree and shrub group: Houdek - 3; Stickney - 4

Forage suitability group: Houdek - Loam; Stickney - Clayey Subsoil

HxA—Houdek-Stickney-Tetonka complex, 0 to 2 percent slopes

Composition

Houdek and similar soils: 40 to 55 percent

Stickney and similar soils: 25 to 35 percent

Tetonka and similar soils: 15 to 25 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains (fig. 11)

Landform position: Houdek - summits and backslopes; Stickney - footslopes; Tetonka - basins

Slope range: Houdek - 0 to 2 percent; Stickney - 0 to 2 percent; Tetonka - 0 to 1 percent

Shape of areas: Irregular

Size of areas: 25 to 300 acres

Typical Profile

Houdek

Surface layer:

0 to 6 inches - dark gray loam

Subsoil:

6 to 11 inches - dark grayish brown clay loam

11 to 19 inches - grayish brown clay loam

19 to 42 inches - light yellowish brown, calcareous clay loam

Underlying layer:

42 to 63 inches - grayish brown, calcareous clay loam with relict redox features

63 to 80 inches - grayish brown, calcareous clay loam with redox concentrations and depletions

Stickney

Surface layer:

0 to 7 inches - dark gray silt loam

Subsurface layer:

7 to 10 inches - gray silt loam



Figure 11. Wetlands with ponded water dot the landscape in an area of Houdek-Stickney-Tetonka complex, 0 to 2 percent slopes.

Transitional layer:

10 to 13 inches - dark grayish brown and gray silty clay loam

Subsoil:

13 to 22 inches - dark grayish brown clay loam

22 to 40 inches - light brownish gray, calcareous clay loam

Underlying layer:

40 to 80 inches - grayish brown, calcareous clay loam

Tetonka**Surface layer:**

0 to 8 inches - grayish brown silt loam

Subsurface layer:

8 to 13 inches - light gray, silt loam with redox concentrations

Subsoil:

13 to 25 inches - dark gray silty clay

25 to 39 inches - gray silty clay

39 to 47 inches - grayish brown, calcareous clay loam with redox concentrations and depletions

47 to 62 inches - light olive gray, calcareous clay loam with redox concentrations and depletions

Underlying layer:

62 to 80 inches - pale olive, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Houdek - well drained; Stickney - moderately well drained; Tetonka - poorly drained

Depth to restrictive feature: Houdek - none; Stickney - none; Tetonka - none

Depth to contrasting parent material: Houdek - greater than 60 inches; Stickney - greater than 60 inches; Tetonka - greater than 60 inches

Depth to high water table: Houdek - 4 to 6 feet; Stickney - 3.5 to 5 feet; Tetonka - plus 1 to 1 foot

Flooding: Houdek - none; Stickney - none; Tetonka - none

Ponding: Houdek - none; Stickney - none; Tetonka - frequent for long periods

Permeability: Houdek - moderately slow; Stickney - slow; Tetonka - slow

Available water capacity: Houdek - high; Stickney - high; Tetonka - high

Organic matter content: Houdek - moderate; Stickney - moderate; Tetonka - high

Surface runoff: Houdek - low; Stickney - low; Tetonka - negligible

Inclusions**Contrasting inclusions:**

Moderately well drained Dudley soils which have more exchangeable sodium in the subsoil than the Stickney soil on lower footslopes

Moderately well drained Prosper soils which do not have a sodium-affected subsoil and are dark to a depth greater than 20 inches on footslopes

Similar inclusions:

Soils that have more clay in the subsoil than the Houdek soil

Use and Management**Cropland**

Main crops: Houdek and Stickney - corn, soybeans, spring wheat, alfalfa, and sunflowers; Tetonka - corn, soybeans, spring wheat, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Houdek - few limitations except to conserve moisture; Stickney - slow permeability; Tetonka - ponding, high water table, slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.

The Tetonka soil is better suited to late-planted crops. Maintain existing drainage systems to remove excess water on the Tetonka soil.

Deferring tillage when the soils are wet helps to limit compaction.

Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Houdek - IIc; Stickney - IIIs; Tetonka - IVw

Ecological site: Houdek - Loamy; Stickney - Clayey; Tetonka - Wet Meadow

Conservation tree and shrub group: Houdek - 3; Stickney - 4; Tetonka - 10

Forage suitability group: Houdek - Loam; Stickney - Clayey Subsoil; Tetonka - Wet

Hy—Hoven silt loam, 0 to 1 percent slopes**Composition**

Hoven and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Basins

Slope range: 0 to 1 percent

Shape of areas: Oval

Size of areas: 5 to 50 acres

Typical Profile**Surface layer:**

0 to 3 inches - gray silt loam

Subsoil:

3 to 22 inches - gray silty clay

22 to 43 inches - grayish brown, calcareous silty clay loam

43 to 51 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Underlying layer:

51 to 80 inches - gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Poorly drained

Depth to restrictive feature: Natric; top depth ranges from 1 to 6 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: Plus 1 to 1.5 feet

Flooding: None

Ponding: Frequent for long periods

Permeability: Very slow

Available water capacity: Moderate

Organic matter content: Moderate

Surface runoff: Negligible

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Davison soils which are calcareous at or near the surface on footslopes

Poorly drained Tetonka soils which do not have a sodium-affected subsoil and have a thicker surface layer in the center of the basins

Use and Management

Rangeland

Main crops: Unsuit

Suitability for cropland: Unsuit

Management concerns:

Ponding, high water table, sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability

Management measures:

Proper grazing management helps to maintain plant vigor.

Restricting grazing during wet periods helps to limit compaction.

Interpretive Groups

Land capability classification: VIs

Ecological site: Closed Depression

Conservation tree and shrub group: 10

Forage suitability group: Not Suited

le—Ipage-Els-Shue complex, 0 to 6 percent slopes

Composition

Ipage and similar soils: 40 to 50 percent

Els and similar soils: 25 to 35 percent

Shue and similar soils: 15 to 25 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Ipage - summits and backslopes; Els - footslopes; Shue - basins

Slope range: Ipage - 2 to 6 percent; Els - 0 to 2 percent; Shue - 0 to 1 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Ipage

Surface layer:

0 to 6 inches - dark grayish brown fine sand

Underlying layer:

6 to 61 inches - grayish brown, dark gray, and light yellowish brown fine sand and loamy fine sand with redox concentrations in the lower part

61 to 80 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

Els

Surface layer:

0 to 7 inches - dark gray fine sand

Transitional layer:

7 to 15 inches - grayish brown fine sand

Underlying layer:

15 to 49 inches - light brownish gray and dark gray, fine sand and loamy fine sand with redox concentrations

49 to 80 inches - pale yellow and light gray, calcareous clay loam with redox concentrations and depletions

Shue

Surface layer:

0 to 8 inches - dark gray loamy fine sand

Transitional layer:

8 to 13 inches - dark grayish brown loamy fine sand

Underlying layer:

13 to 26 inches - light yellowish brown fine sand

26 to 80 inches - light brownish gray and light gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: lpage - moderately well drained; Els - somewhat poorly drained; Shue - poorly drained

Depth to restrictive feature: lpage - none; Els - none; Shue - none

Depth to contrasting parent material: lpage - greater than 60 inches over glacial till; Els - greater than 40 inches over glacial till; Shue - 20 to 40 inches over glacial till

Depth to high water table: lpage - 3.5 to 5 feet; Els - 1.5 to 3 feet; Shue - plus 1 to 1 foot

Flooding: lpage - none; Els - none; Shue - none

Ponding: lpage - none; Els - none; Shue - occasional for long periods

Permeability: lpage - rapid in the sandy sediments and moderately slow in the underlying glacial till; Els - rapid in the sandy sediments and moderately slow in the underlying glacial till; Shue - rapid in the sandy sediments and moderately slow in the underlying glacial till

Available water capacity: lpage - low; Els - moderate; Shue - moderate

Organic matter content: lpage - low; Els - moderately low; Shue - moderate

Surface runoff: lpage - very low; Els - very low; Shue - negligible

Inclusions

Contrasting inclusions:

Well drained Forestburg soils which have glacial till at a depth of 20 to 40 inches on backslopes

Poorly drained Toko soils in the center of basins

Similar inclusions:

Soils that have a darker surface layer than the Els soil

Use and Management

Cropland

Main crops: Corn, soybeans, alfalfa, sunflowers, and spring wheat

Suitability for cropland: Fairly well suited

Management concerns:

Ipague - wind erosion, low available water capacity; Els - wind erosion, moderate available water capacity; Shue - ponding, high water table, wind erosion

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to control wind erosion and conserve moisture.

Wind stripcropping and field windbreaks also help to control wind erosion.

The Shue soil is better suited to late-planted crops.

Interpretive Groups

Land capability classification: Ipague - VIe; Els - VIe; Shue - IVw

Ecological site: Ipague - Sandy; Els - Subirrigated; Shue - Wet Meadow

Conservation tree and shrub group: Ipague - 7; Els - 2; Shue - 2

Forage suitability group: Ipague - Sand; Els - Subirrigated; Shue - Wet

Jh—Jerauld-Hoven silt loams, 0 to 2 percent slopes

Composition

Jerauld and similar soils: 45 to 60 percent

Hoven and similar soils: 30 to 45 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Jerauld - footslopes; Hoven - basins

Slope range: Jerauld - 0 to 2 percent; Hoven - 0 to 1 percent

Shape of areas: Irregular

Size of areas: 15 to 100 acres

Typical Profile

Jerauld

Surface layer:

0 to 2 inches - gray silt loam

Subsoil:

2 to 14 inches - dark gray clay loam

14 to 33 inches - grayish brown, calcareous clay loam with masses of salt and nests of gypsum

33 to 41 inches - light brownish gray, calcareous clay loam with masses of salt, nests of gypsum, and redox concentrations and depletions

Underlying layer:

41 to 61 inches - grayish brown, calcareous clay loam with redox concentrations and depletions

61 to 80 inches - gray, calcareous clay loam with redox concentrations and depletions

Hoven**Surface layer:**

0 to 3 inches - gray silt loam

Subsoil:

3 to 22 inches - gray silty clay

22 to 43 inches - grayish brown, calcareous silty clay loam

43 to 51 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Underlying layer:

51 to 80 inches - gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Jerauld - somewhat poorly drained; Hoven - poorly drained

Depth to restrictive feature: Jerauld - natric-top depth ranges from 1 to 5 inches;
Hoven - natric-top depth ranges from 1 to 6 inches

Depth to contrasting parent material: Jerauld - greater than 60 inches;
Hoven - greater than 60 inches

Depth to high water table: Jerauld - 1.5 to 3.5 feet; Hoven - plus 1 to 1.5 feet

Flooding: Jerauld - none; Hoven - none

Ponding: Jerauld - none; Hoven - frequent for long periods

Permeability: Jerauld - very slow; Hoven - very slow

Available water capacity: Jerauld - moderate; Hoven - moderate

Organic matter content: Jerauld - moderately low; Hoven - moderate

Surface runoff: Jerauld - low; Hoven - negligible

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Moderately well drained Dudley and Stickney (less exchangeable sodium than the Dudley soil) soils which do not have visible salts within a depth of 16 inches on footslopes

Use and Management**Rangeland**

Main crops: Unsited

Suitability for cropland: Unsited

Management concerns:

Jerauld - sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability;
Hoven - ponding, high water table, sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability

Management measures:

Proper grazing management helps to maintain plant vigor.
Restricting grazing during wet periods helps to limit compaction.
Seed cultivated areas to adapted species.

Interpretive Groups

Land capability classification: Jerauld - VIs; Hoven - VIs

Ecological site: Jerauld - Thin Claypan; Hoven - Closed Depression

Conservation tree and shrub group: Jerauld - 10; Hoven - 10

Forage suitability group: Jerauld - Not Suited; Hoven - Not Suited

KaA—Kranzburg-Brookings silt loams, 0 to 2 percent slopes

Composition

Kranzburg and similar soils: 45 to 55 percent

Brookings and similar soils: 35 to 45 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Kranzburg - summits and backslopes; Brookings - footslopes

Slope range: Kranzburg - 0 to 2 percent; Brookings - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Kranzburg

Surface layer:

0 to 7 inches - dark gray silt loam

Subsoil:

7 to 14 inches - grayish brown silt loam

14 to 26 inches - pale yellow, calcareous silt loam

26 to 36 inches - light brownish gray, calcareous clay loam

Underlying layer:

36 to 52 inches - light brownish gray, calcareous clay loam with relict redox features

52 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Brookings

Surface layer:

0 to 15 inches - dark gray silt loam

Subsoil:

15 to 25 inches - grayish brown silt loam

25 to 35 inches - light yellowish brown, calcareous silt loam

Underlying layer:

35 to 40 inches - light yellowish brown, calcareous loam with redox concentrations and depletions

40 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Kranzburg - well drained; Brookings - moderately well drained

Depth to restrictive feature: Kranzburg - none; Brookings - none

Depth to contrasting parent material: Kranzburg - 20 to 40 inches over glacial till; Brookings - 20 to 40 inches over glacial till

Depth to high water table: Kranzburg - 4 to 6 feet; Brookings - 3 to 5 feet

Flooding: Kranzburg - none; Brookings - none

Ponding: Kranzburg - none; Brookings - none

Permeability: Kranzburg - moderately slow; Brookings - moderately slow

Available water capacity: Kranzburg - high; Brookings - high

Organic matter content: Kranzburg - moderate; Brookings - high

Surface runoff: Kranzburg - low; Brookings - low

Other properties: Runoff water flows over the Brookings soil during periods of rainfall or snowmelt.

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Buse soils which are calcareous to the surface on shoulders

Moderately well drained Cresbard soils which have a sodium-affected subsoil on footslopes

Poorly drained Tonka soils in basins

Similar inclusions:

Soils that have more sand and less silt than the Kranzburg soil

Soils that are greater than 40 inches to loamy glacial till

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Well suited

Management concerns:

Few limitations except to conserve moisture

Management measures:

Managing tillage and leaving crop residue conserves moisture and helps to maintain organic matter content and tilth.

Interpretive Groups

Land capability classification: Kranzburg - IIc; Brookings - IIc

Ecological site: Kranzburg - Loamy; Brookings - Loamy Overflow

Conservation tree and shrub group: Kranzburg - 3; Brookings - 1

Forage suitability group: Kranzburg - Loam; Brookings - Overflow

KbB—Kranzburg-Brookings-Buse complex, 1 to 6 percent slopes

Composition

Kranzburg and similar soils: 35 to 50 percent

Brookings and similar soils: 25 to 35 percent

Buse and similar soils: 20 to 25 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Kranzburg - summits and backslopes; Brookings - footslopes; Buse - shoulders

Slope range: Kranzburg - 2 to 6 percent; Brookings - 1 to 2 percent; Buse - 3 to 6 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Kranzburg

Surface layer:

0 to 7 inches - dark gray silt loam

Subsoil:

7 to 14 inches - grayish brown silt loam

14 to 26 inches - pale yellow, calcareous silt loam

26 to 36 inches - light brownish gray, calcareous clay loam

Underlying layer:

36 to 52 inches - light brownish gray, calcareous clay loam with relict redox features

52 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Brookings

Surface layer:

0 to 15 inches - dark gray silt loam

Subsoil:

15 to 25 inches - grayish brown silt loam

25 to 35 inches - light yellowish brown, calcareous silt loam

Underlying layer:

35 to 40 inches - light yellowish brown, calcareous loam with redox concentrations and depletions

40 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Buse

Surface layer:

0 to 7 inches - dark gray, calcareous loam

Subsoil:

7 to 21 inches - light brownish gray, calcareous loam

21 to 35 inches - light brownish gray, calcareous clay loam with relict redox features

Underlying layer:

35 to 63 inches - light yellowish brown, calcareous clay loam with relict redox features

63 to 80 inches - light brownish gray, calcareous clay loam with relict redox features

Soil Properties and Qualities

Drainage class: Kranzburg - well drained; Brookings - moderately well drained;
Buse - well drained

Depth to restrictive feature: Kranzburg - none; Brookings - none; Buse - none

Depth to contrasting parent material: Kranzburg - 20 to 40 inches over glacial till;
Brookings - 20 to 40 inches over glacial till; Buse - greater than 60 inches

Depth to high water table: Kranzburg - 4 to 6 feet; Brookings - 3 to 5 feet;
Buse - greater than 6 feet

Flooding: Kranzburg - none; Brookings - none; Buse - none

Ponding: Kranzburg - none; Brookings - none; Buse - none

Permeability: Kranzburg - moderately slow; Brookings - moderately slow;
Buse - moderately slow

Available water capacity: Kranzburg - high; Brookings - high; Buse - high

Organic matter content: Kranzburg - moderate; Brookings - high;
Buse - moderately low

Surface runoff: Kranzburg - medium; Brookings - low; Buse - medium

Other properties: Runoff water flows over the Brookings soil during periods of rainfall or snowmelt.

Inclusions

Contrasting inclusions:

Moderately well drained Cresbard soils which have a sodium-affected subsoil on footslopes

Poorly drained Tonka soils in basins

Similar inclusions:

Soils that have more sand and less silt than the Kranzburg soil

Soils that have more sand and less silt than the Brookings soil

Soils that have loamy glacial till at a greater depth than the Kranzburg and Brookings soils

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Kranzburg - water erosion; Brookings - few limitations except to conserve moisture; Buse - water and wind erosion, high content of lime adversely affects the availability of plant nutrients

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control erosion and conserve moisture.

Contour farming and grassed waterways also help to control water erosion, but slopes in some areas are too short or too irregular for contouring.

Applying animal wastes, especially on the Buse soil, helps maintain fertility.

Rotations including grasses and legumes help to control erosion and maintain fertility, organic matter content, and tilth.

Interpretive Groups

Land capability classification: Kranzburg - IIe; Brookings - IIc; Buse - IIIe

Ecological site: Kranzburg - Loamy; Brookings - Loamy Overflow; Buse - Thin Loamy

Conservation tree and shrub group: Kranzburg - 3; Brookings - 1; Buse - 8K

Forage suitability group: Kranzburg - Loam; Brookings - Overflow; Buse - Limy Upland

KcA—Kranzburg-Cresbard silt loams, 0 to 2 percent slopes

Composition

Kranzburg and similar soils: 50 to 60 percent

Cresbard and similar soils: 20 to 35 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Till plains

Landform position: Kranzburg - summits and backslopes; Cresbard - footslopes

Slope range: Kranzburg - 0 to 2 percent; Cresbard - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Kranzburg

Surface layer:

0 to 7 inches - dark gray silt loam

Subsoil:

7 to 14 inches - grayish brown silt loam

14 to 26 inches - pale yellow, calcareous silt loam

26 to 36 inches - light brownish gray, calcareous clay loam

Underlying layer:

36 to 52 inches - light brownish gray, calcareous clay loam with relict redox features

52 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Cresbard

Surface layer:

0 to 6 inches - dark gray silt loam

Subsurface layer:

6 to 8 inches - gray silt loam

Transitional layer:

8 to 11 inches - dark gray and gray clay loam

Subsoil:

11 to 22 inches - dark gray clay loam

22 to 28 inches - pale yellow, calcareous clay loam

28 to 38 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Underlying layer:

38 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Kranzburg - well drained; Cresbard - moderately well drained

Depth to restrictive feature: Kranzburg - none; Cresbard - none

Depth to contrasting parent material: Kranzburg - 20 to 40 inches over glacial till; Cresbard - greater than 60 inches

Depth to high water table: Kranzburg - 4 to 6 feet; Cresbard - 3.5 to 5 feet

Flooding: Kranzburg - none; Cresbard - none

Ponding: Kranzburg - none; Cresbard - none

Permeability: Kranzburg - moderately slow; Cresbard - slow

Available water capacity: Kranzburg - high; Cresbard - high

Organic matter content: Kranzburg - moderate; Cresbard - moderate

Surface runoff: Kranzburg - low; Cresbard - low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Brookings soils which do not have a sodium-affected subsoil and are dark to a depth greater than 16 inches on footslopes
 Moderately well drained Cavour soils which have more exchangeable sodium in the subsoil than the Cresbard soil on footslopes
 Poorly drained Tonka soils in basins

Similar inclusions:

Soils that have more sand and less silt than the Kranzburg soil
 Soils that have loamy glacial till at a greater depth than the Kranzburg soil
 Soils that have more silt and less clay in the subsoil than the Cresbard soil

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers
 Suitability for cropland: Fairly well suited

Management concerns:

Kranzburg - few limitations except to conserve moisture; Cresbard - slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.
 Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Kranzburg - IIc; Cresbard - IIIs

Ecological site: Kranzburg - Loamy; Cresbard - Clayey

Conservation tree and shrub group: Kranzburg - 3; Cresbard - 4

Forage suitability group: Kranzburg - Loam; Cresbard - Clayey Subsoil

KtA—Kranzburg-Cresbard-Tonka silt loams, 0 to 2 percent slopes

Composition

Kranzburg and similar soils: 40 to 50 percent
 Cresbard and similar soils: 25 to 35 percent
 Tonka and similar soils: 15 to 25 percent
 Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Kranzburg - summits and backslopes; Cresbard - footslopes; Tonka - basins

Slope range: Kranzburg - 0 to 2 percent; Cresbard - 0 to 2 percent; Tonka - 0 to 1 percent

Shape of areas: Irregular

Size of areas: 10 to 150 acres

Typical Profile

Kranzburg

Surface layer:

0 to 7 inches - dark gray silt loam

Subsoil:

7 to 14 inches - grayish brown silt loam

14 to 26 inches - pale yellow, calcareous silt loam

26 to 36 inches - light brownish gray, calcareous clay loam

Underlying layer:

36 to 52 inches - light brownish gray, calcareous clay loam with relict redox features,

52 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Cresbard

Surface layer:

0 to 6 inches - dark gray silt loam

Subsurface layer:

6 to 8 inches - gray silt loam

Transitional layer:

8 to 11 inches - dark gray and gray clay loam

Subsoil:

11 to 22 inches - dark gray clay loam

22 to 28 inches - pale yellow, calcareous clay loam

28 to 38 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Underlying layer:

38 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Tonka

Surface layer:

0 to 8 inches - dark gray silt loam

Subsurface layer:

8 to 16 inches - light gray silt loam with redox concentrations

Subsoil:

16 to 35 inches - dark gray silty clay

35 to 41 inches - gray silty clay

Underlying layer:

41 to 68 inches - light gray, calcareous clay loam with redox concentrations and depletions

68 to 80 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Kranzburg - well drained; Cresbard - moderately well drained;
Tonka - poorly drained

Depth to restrictive feature: Kranzburg - none; Cresbard - none; Tonka - none

Depth to contrasting parent material: Kranzburg - 20 to 40 inches over glacial till;
Cresbard - greater than 60 inches; Tonka - greater than 60 inches

Depth to high water table: Kranzburg - 4 to 6 feet; Cresbard - 3.5 to 5 feet;
Tonka - plus 1 to 1.5 feet

Flooding: Kranzburg - none; Cresbard - none; Tonka - none

Ponding: Kranzburg - none; Cresbard - none; Tonka - frequent for long periods

Permeability: Kranzburg - moderately slow; Cresbard - slow; Tonka - slow

Available water capacity: Kranzburg - high; Cresbard - high; Tonka - high

Organic matter content: Kranzburg - moderate; Cresbard - moderate; Tonka - high

Surface runoff: Kranzburg - low; Cresbard - low; Tonka - negligible

Inclusions

Contrasting inclusions:

Moderately well drained Brookings soils which do not have a sodium-affected subsoil and are dark to a depth greater than 16 inches on footslopes

Moderately well drained Cavour soils which have less exchangeable sodium in the subsoil than the Cresbard soil on footslopes

Similar inclusions:

Soils that have loamy glacial till at a greater depth than the Kranzburg soil

Soils that have more silt and less clay in the subsoil than the Cresbard soil

Use and Management

Cropland

Main crops: Kranzburg and Cresbard - corn, soybeans, spring wheat, alfalfa, and sunflowers; Tonka - corn, soybeans, spring wheat, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Kranzburg - few limitations except to conserve moisture; Cresbard - slow permeability; Tonka - ponding, high water table, slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.

The Tonka soil is better suited to late-planted crops. Deferring tillage when the soils are wet helps to limit compaction. Maintain existing drainage systems to remove excess water on the Tonka soil.

Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Kranzburg - IIc; Cresbard - IIIs; Tonka - IVw

Ecological site: Kranzburg - Loamy; Cresbard - Clayey; Tonka - Wet Meadow

Conservation tree and shrub group: Kranzburg - 3; Cresbard - 4; Tonka - 10

Forage suitability group: Kranzburg - Loam; Cresbard - Clayey Subsoil;
Tonka - Wet Meadow

KzB—Kranzburg-Zell-Aastad complex, 1 to 6 percent slopes

Composition

Kranzburg and similar soils: 35 to 45 percent

Zell and similar soils: 25 to 35 percent

Aastad and similar soils: 15 to 25 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Kranzburg - summits and backslopes; Zell - shoulders;
Aastad - footslopes

Slope range: Kranzburg - 2 to 6 percent; Zell - 2 to 6 percent; Aastad - 1 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Kranzburg

Surface layer:

0 to 7 inches - dark gray silt loam

Subsoil:

7 to 14 inches - grayish brown silt loam

14 to 26 inches - pale yellow, calcareous silt loam

26 to 36 inches - light brownish gray, calcareous clay loam

Underlying layer:

36 to 52 inches - light brownish gray, calcareous clay loam with relict redox features

52 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Zell

Surface layer:

0 to 7 inches - dark grayish brown, calcareous silt loam

Subsoil:

7 to 31 inches - pale yellow, calcareous silt loam

Underlying layer:

31 to 49 inches - pale yellow, calcareous, varved silt loam

49 to 80 inches - pale yellow, calcareous, varved silt loam with relict redox features

Aastad

Surface layer:

0 to 14 inches - dark gray loam

Subsoil:

14 to 21 inches - grayish brown clay loam

21 to 29 inches - light olive brown, clay loam with redox concentrations

29 to 43 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

43 to 57 inches - grayish brown, calcareous clay loam with redox concentrations and depletions

Underlying layer:

57 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Kranzburg - well drained; Zell - well drained; Aastad - moderately well drained

Depth to restrictive feature: Kranzburg - none; Zell - none; Aastad - none
Depth to contrasting parent material: Kranzburg - 20 to 40 inches over glacial till;
 Zell - greater than 60 inches; Aastad - greater than 60 inches
Depth to high water table: Kranzburg - 4 to 6 feet; Zell - greater than 6 feet;
 Aastad - 3 to 5 feet
Flooding: Kranzburg - none; Zell - none; Aastad - none
Ponding: Kranzburg - none; Zell - none; Aastad - none
Permeability: Kranzburg - moderately slow; Zell - moderate in the solum and
 moderate to slow in the underlying material; Aastad - moderately slow
Available water capacity: Kranzburg - high; Zell - high; Aastad - high
Organic matter content: Kranzburg - moderate; Zell - moderately low; Aastad - high
Surface runoff: Kranzburg - medium; Zell - medium; Aastad - low
Other properties: Runoff water flows over the Aastad soil during periods of rainfall
 or snowmelt.

Inclusions

Contrasting inclusions:

Well drained Great Bend soils which are not calcareous to the surface and have
 varves within a depth of 40 inches on backslopes

Similar inclusions:

Soils that have more sand and less silt than the Kranzburg soil
 Soils that have more silt and less sand than the Aastad soil

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers
 Suitability for cropland: Fairly well suited

Management concerns:

Kranzburg - water erosion; Zell - water and wind erosion, high content of lime
 adversely affects the availability of plant nutrients; Aastad - few limitations
 except to conserve moisture

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control erosion
 and conserve moisture.
 Contour farming and grassed waterways also help to control water erosion, but
 slopes in some areas are too short or too irregular for contouring.
 Applying animal wastes, especially on the Zell soil, helps maintain fertility.
 Rotations including grasses and legumes help to control erosion and maintain
 fertility, organic matter content, and tilth.

Interpretive Groups

Land capability classification: Kranzburg - IIe; Zell - IIIe; Aastad - IIc
Ecological site: Kranzburg - Loamy; Zell - Thin Loamy; Aastad - Loamy Overflow
Conservation tree and shrub group: Kranzburg - 3; Zell - 8K; Aastad - 1
Forage suitability group: Kranzburg - Loam; Zell - Limy Upland; Aastad - Overflow

La—La Prairie loam, 0 to 2 percent slopes

Composition

La Prairie and similar soils: 80 to 90 percent
 Contrasting inclusions: 10 to 20 percent

Setting

Landform: Flood plains
Landform position: High flood plains
Slope range: 0 to 2 percent
Shape of areas: Irregular
Size of areas: 10 to 100 acres

Typical Profile

Surface layer:
0 to 13 inches - very dark gray loam
Subsurface layer:
13 to 24 inches - dark gray loam
Subsoil:
24 to 33 inches - brown loam
33 to 44 inches - light brownish gray, calcareous loam
Underlying layer:
44 to 80 inches - light olive brown, calcareous, stratified loamy sand and clay loam with redox depletions

Soil Properties and Qualities

Drainage class: Moderately well drained
Depth to restrictive feature: None
Depth to contrasting parent material: Greater than 60 inches
Depth to high water table: 3.5 to 5 feet
Flooding: Rare for brief periods
Ponding: None
Permeability: Moderate
Available water capacity: High
Organic matter content: High
Surface runoff: Low

Inclusions

Contrasting inclusions: (May have significant management concerns)
Somewhat poorly drained Lamoure soils which have more silt and less sand on low flood plains
Somewhat poorly drained Moritz soils which are calcareous to the surface on high flood plains
Somewhat poorly drained Ranslo soils which have a sodium-affected subsoil on low flood plains
Similar inclusions:
Soils that have more silt and less sand

Use and Management

Cropland
Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers
Suitability for cropland: Well suited
Management concerns:
Few limitations except to conserve moisture
Management measures:
Managing tillage and leaving crop residue conserves moisture and helps to maintain organic matter content and tilth.

Interpretive Groups

Land capability classification: IIc

Ecological site: Loamy

Conservation tree and shrub group: 1

Forage suitability group: Loam

Lc—La Prairie-Holmquist loams, channeled

Composition

La Prairie and similar soils: 45 to 55 percent

Holmquist and similar soils: 30 to 45 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Flood plains (fig. 12)

Landform position: La Prairie - low flood plains; Holmquist - low flood plains

Slope range: La Prairie - 0 to 2 percent; Holmquist - 0 to 2 percent

Shape of areas: Long and narrow

Size of areas: 20 to 500 acres

Typical Profile

La Prairie

Surface layer:

0 to 13 inches - very dark gray loam

Subsurface layer:

13 to 24 inches - dark gray loam

Subsoil:

24 to 33 inches - brown loam

33 to 44 inches - light brownish gray, calcareous loam

Underlying layer:

44 to 80 inches - light olive brown, stratified calcareous loamy sand and clay loam with redox depletions

Holmquist

Surface layer:

0 to 3 inches - very dark gray loam

Subsurface layer:

3 to 7 inches - very dark gray, calcareous stratified loam and fine sandy loam

Underlying layer:

7 to 36 inches - grayish brown, gray, dark gray, and olive gray, calcareous stratified loam, clay loam, and fine sandy loam with masses of salt and redox concentrations and depletions in the lower part

36 to 80 inches - gray, calcareous stratified clay loam and sand with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: La Prairie - moderately well drained; Holmquist - poorly drained

Depth to restrictive feature: La Prairie - none; Holmquist - none

Depth to contrasting parent material: La Prairie - greater than 60 inches;

Holmquist - greater than 60 inches

Depth to high water table: La Prairie - 3.5 to 5 feet; Holmquist - 0.5 to 1.5 feet

Flooding: La Prairie - occasional for brief periods; Holmquist - frequent for brief periods

Ponding: La Prairie - none; Holmquist - none

Permeability: La Prairie - moderate; Holmquist - moderate

Available water capacity: La Prairie - high; Holmquist - high

Organic matter content: La Prairie - high; Holmquist - moderate

Surface runoff: La Prairie - low; Holmquist - very low

Other properties: These areas typically are dissected by meandering stream channels.

Inclusions

Contrasting inclusions: (May have significant management concerns)

Somewhat poorly drained Lamoure soils which have more silt and less sand on low flood plains

Somewhat poorly drained Ranslo soils which have a sodium-affected subsoil on low flood plains

Similar inclusions:

Soils that have more silt and less sand than the La Prairie soil

Use and Management

Rangeland

Main crops: Unsited

Suitability for cropland: Unsited

Management concerns:

La Prairie - flooding, stream channel severely limits use of machinery;

Holmquist - flooding, stream channel severely limits use of machinery



Figure 12. A meandering stream channel in an area of La Prairie-Holmquist loams, channeled.

Management measures:

Proper grazing management helps to maintain plant vigor and control stream bank erosion.

Restricting grazing during wet periods helps to limit compaction.

Interpretive Groups

Land capability classification: La Prairie - VIw; Holmquist - VIw

Ecological site: La Prairie - Loamy Overflow; Holmquist - Saline Subirrigated

Conservation tree and shrub group: La Prairie - 1; Holmquist - 10

Forage suitability group: La Prairie - Overflow; Holmquist - Saline

Ld—LaDelle silt loam, 0 to 2 percent slopes**Composition**

LaDelle and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Flood plains

Landform position: High flood plains

Slope range: 0 to 2 percent

Shape of areas: Long and narrow

Size of areas: 10 to 200 acres

Typical Profile**Surface layer:**

0 to 19 inches - dark gray, calcareous silt loam

Transitional layer:

19 to 27 inches - gray, calcareous silt loam

Subsoil:

27 to 38 inches - grayish brown, calcareous silt loam

Underlying layer:

38 to 80 inches - gray, dark gray, and light brownish gray, calcareous silt loam and silty clay loam

Soil Properties and Qualities

Drainage class: Moderately well drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: 3.5 to 5 feet

Flooding: Rare for brief periods

Ponding: None

Permeability: Moderate

Available water capacity: High

Organic matter content: High

Surface runoff: Low

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Somewhat poorly drained Lamoure soils which are calcareous to the surface on low flood plains

Somewhat poorly drained Ranslo soils which have a sodium-affected subsoil on low flood plains

Similar inclusions:

Soils that have more sand and less silt

Use and Management**Cropland**

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Well suited

Management concerns:

Few limitations except to conserve moisture

Management measures:

Managing tillage and leaving crop residue conserves moisture and helps to maintain organic matter content and tilth.

Interpretive Groups

Land capability classification: IIc

Ecological site: Loamy

Conservation tree and shrub group: 1

Forage suitability group: Loam

Le—LaDelle silt loam, channeled**Composition**

LaDelle and similar soils: 80 to 90 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Flood plains

Landform position: Low flood plains

Slope range: 0 to 2 percent

Shape of areas: Long and narrow

Size of areas: 20 to 300 acres

Typical Profile**Surface layer:**

0 to 19 inches - dark gray, calcareous silt loam

Transitional layer:

19 to 27 inches - gray, calcareous silt loam

Subsoil:

27 to 38 inches - grayish brown, calcareous silt loam

Underlying layer:

38 to 80 inches - gray, dark gray, and light brownish gray, calcareous silt loam and silty clay loam

Soil Properties and Qualities

Drainage class: Moderately well drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: 3.5 to 5 feet

Flooding: Frequent for brief periods

Ponding: None

Permeability: Moderate

Available water capacity: High

Organic matter content: High

Surface runoff: Low

Other properties: These areas typically are dissected by meandering stream channels.

Inclusions

Contrasting inclusions: (May have significant management concerns)

Somewhat poorly drained Lamoure soils which are calcareous to the surface on low flood plains

Somewhat poorly drained Ranslo soils which have a sodium-affected subsoil on high flood plains

Similar inclusions:

Soils that have more sand and less silt

Use and Management

Rangeland

Main crops: Unsited

Suitability for cropland: Unsited

Management concerns:

Flooding, stream channel severely limits use of machinery

Management measures:

Proper grazing management helps to maintain plant vigor and control stream bank erosion.

Restricting grazing during wet periods helps to limit compaction.

Interpretive Groups

Land capability classification: Vlw

Ecological site: Loamy Overflow

Conservation tree and shrub group: 1

Forage suitability group: Overflow

Lk—Lamo silty clay loam, 0 to 1 percent slopes

Composition

Lamo and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Flood plains

Landform position: Low flood plains

Slope range: 0 to 1 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Surface layer:

0 to 17 inches - dark gray and very dark gray, calcareous silty clay loam

Subsurface layer:

17 to 22 inches - dark gray, calcareous silt loam

Transitional layer:

22 to 30 inches - grayish brown, calcareous silt loam

Underlying layer:

30 to 47 inches - light brownish gray, calcareous silt loam with redox depletions

47 to 80 inches - light brownish gray, calcareous silt loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Depth to restrictive feature: None
Depth to contrasting parent material: Greater than 60 inches
Depth to high water table: 1 to 3 feet
Flooding: Occasional for brief periods
Ponding: None
Permeability: Moderately slow
Available water capacity: High
Organic matter content: Moderate
Surface runoff: Low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Bon soils which have more sand and less silt on high flood plains

Poorly drained Lawet soils on low flood plains

Similar inclusions:

Soils that are dark to a depth less than 24 inches

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Flooding, high water table, wind erosion, high content of lime adversely affects the availability of plant nutrients

Management measures:

In most years the soil is better suited to late-planted crops.

Leaving crop residue on the surface and deferring tillage when the soil is wet help to maintain tilth, control wind erosion, and limit compaction.

Rotations including grasses and legumes help to control wind erosion and maintain organic matter content and tilth.

Interpretive Groups

Land capability classification: IIw

Ecological site: Subirrigated

Conservation tree and shrub group: 2K

Forage suitability group: Subirrigated

Lm—Lamoure silty clay loam, 0 to 1 percent slopes

Composition

Lamoure and similar soils: 80 to 90 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Flood plains

Landform position: Low flood plains

Slope range: 0 to 1 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Surface layer:

0 to 8 inches - dark gray, calcareous silty clay loam

Subsurface layer:

8 to 38 inches - gray, calcareous silty clay loam with redox concentrations in the lower part

Underlying layer:

38 to 80 inches - light brownish gray, calcareous silt loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Somewhat poorly drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: 0 to 2 feet

Flooding: Frequent for brief to long periods

Ponding: None

Permeability: Moderately slow

Available water capacity: High

Organic matter content: High

Surface runoff: Low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained LaDelle soils which are not calcareous to the surface on high flood plains

Poorly drained Lowe soils on low flood plains

Poorly drained Ludden soils which have more clay and less silt on low flood plains

Similar inclusions:

Soils that are dark to a depth less than 24 inches

Use and Management

Cropland

Main crops: Corn, soybeans, sunflowers, and spring wheat

Suitability for cropland: Fairly well suited

Management concerns:

Flooding, high water table, wind erosion, and high content of lime adversely affects the availability of plant nutrients

Management measures:

In most years the soil is better suited to late-planted crops.

Leaving crop residue on the surface and deferring tillage when the soil is wet help to maintain tilth, control wind erosion, and limit compaction.

Rotations including grasses and legumes help to control wind erosion and maintain organic matter content and tilth.

Interpretive Groups

Land capability classification: IIIw

Ecological site: Subirrigated

Conservation tree and shrub group: 2K

Forage suitability group: Subirrigated

Ln—Lawet loam, 0 to 2 percent slopes**Composition**

Lawet and similar soils: 80 to 90 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Flood plains

Landform position: Low flood plains

Slope range: 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile**Surface layer:**

0 to 8 inches - dark gray, calcareous loam

Transitional layer:

8 to 16 inches - grayish brown, calcareous fine sandy loam with redox concentrations

Subsoil:

16 to 26 inches - light gray, calcareous loam with redox concentrations and depletions

26 to 38 inches - light brownish gray, calcareous loam with redox concentrations and depletions

38 to 51 inches - grayish brown, calcareous loam with redox concentrations and depletions

Underlying layer:

51 to 80 inches - gray, calcareous loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Poorly drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: 1 to 2 feet

Flooding: Occasional for brief periods

Ponding: None

Permeability: Moderately slow

Available water capacity: High

Organic matter content: High

Surface runoff: Low

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Moderately well drained Davison soils on footslopes

Somewhat poorly drained Elsmere soils which are not calcareous to the surface on high flood plains

Poorly drained Toko soils in basins

Similar inclusions:

Soils that have salts closer to the surface

Use and Management

Cropland

Main crops: Corn, soybeans, and sunflowers

Suitability for cropland: Poorly suited

Management concerns:

Ponding, high water table, wind erosion, high content of lime adversely affects the availability of plant nutrients

Management measures:

The soils are better suited to late-planted crops.

Leaving crop residue on the surface and deferring tillage when the soils are wet help to maintain tilth, control wind erosion, and limit compaction.

Rotations including grasses and legumes help to control wind erosion and maintain organic matter content and tilth.

Interpretive Groups

Land capability classification: IVw

Ecological site: Subirrigated

Conservation tree and shrub group: 10

Forage suitability group: Wet

Lo—Lawet loam, wet, 0 to 1 percent slopes

Composition

Lawet and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Flood plains

Landform position: Low flood plains

Slope range: 0 to 1 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Surface layer:

0 to 8 inches - dark gray, calcareous loam

Transitional layer:

8 to 16 inches - grayish brown, calcareous fine sandy loam with redox concentrations

Subsoil:

16 to 26 inches - light gray, calcareous loam with redox concentrations and depletions

26 to 38 inches - light brownish gray, calcareous loam with redox concentrations and depletions

38 to 51 inches - grayish brown, calcareous loam with redox concentrations and depletions

Underlying layer:

51 to 80 inches - gray, calcareous loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Very poorly drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: Plus 1 to 1 foot

Flooding: Occasional for long periods

Ponding: Frequent for very long periods

Permeability: Moderately slow

Available water capacity: High

Organic matter content: High

Surface runoff: Very low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Poorly drained Toko soils in basins

Use and Management

Rangeland

Main crops: Unsited

Suitability for cropland: Generally unsited

Management concerns:

Flooding, high water table, wind erosion, high content of lime adversely affects the availability of plant nutrients

Management measures:

Proper grazing management helps to maintain plant vigor.

Restricted grazing during wet periods helps to limit compaction.

Interpretive Groups

Land capability classification: Vw

Ecological site: Wet Land

Conservation tree and shrub group: 10

Forage suitability group: Not Suited

Lp—Lawet-Davison loams, 0 to 2 percent slopes

Composition

Lawet and similar soils: 55 to 65 percent

Davison and similar soils: 30 to 40 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Flood plains

Landform position: Lawet - low flood plains; Davison - high flood plains

Slope range: Lawet - 0 to 2 percent; Davison - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Lawet

Surface layer:

0 to 8 inches - dark gray, calcareous loam

Transitional layer:

8 to 16 inches - grayish brown, calcareous fine sandy loam with redox concentrations

Subsoil:

16 to 26 inches - light gray, calcareous loam with redox concentrations and depletions

26 to 38 inches - light brownish gray, calcareous loam with redox concentrations and depletions

38 to 51 inches - grayish brown, calcareous loam with redox concentrations and depletions

Underlying layer:

51 to 80 inches - gray, calcareous loam with redox concentrations and depletions

Davison**Surface layer:**

0 to 8 inches - dark gray, calcareous loam

Subsoil:

8 to 28 inches - pale yellow, calcareous loam

Underlying layer:

28 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Lawet - poorly drained; Davison - somewhat poorly drained

Depth to restrictive feature: Lawet - none; Davison - none

Depth to contrasting parent material: Lawet - greater than 60 inches;
Davison - greater than 60 inches

Depth to high water table: Lawet - 1 to 2 feet; Davison - 1.5 to 4 feet

Flooding: Lawet - occasional for brief periods; Davison - none

Ponding: Lawet - none; Davison - none

Permeability: Lawet - moderately slow; Davison - moderately slow

Available water capacity: Lawet - high; Davison - high

Organic matter content: Lawet - high; Davison - moderate

Surface runoff: Lawet - low; Davison - low

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Somewhat poorly drained Elsmere soils which are not calcareous to the surface on high flood plains

Poorly drained Toko soils in basins

Use and Management**Cropland or pasture**

Main crops: Corn, barley, spring wheat, sunflowers, and soybeans

Suitability for cropland: Poorly suited

Management concerns:

Lawet - ponding, high water table, wind erosion, high content of lime adversely affects the availability of plant nutrients; Davison - wind erosion, high content of lime adversely affects the availability of plant nutrients

Management measures:

The soils are better suited to late-planted crops.

Leaving crop residue on the surface and deferring tillage when the soils are wet help to maintain tilth, control wind erosion, and limit compaction.

Rotations including grasses and legumes help to control wind erosion and maintain organic matter content and tilth.

Interpretive Groups

Land capability classification: Lawet - IVw; Davison - IIe

Ecological site: Lawet - Subirrigated; Davison - Limy Subirrigated

Conservation tree and shrub group: Lawet - 10; Davison - 1KK

Forage suitability group: Lawet - Wet; Davison - Subirrigated

LrA—Lehr-Bowdle loams, 0 to 3 percent slopes

Composition

Lehr and similar soils: 45 to 60 percent

Bowdle and similar soils: 25 to 40 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Outwash plains

Landform position: Lehr - summits and backslopes; Bowdle - footslopes

Slope range: Lehr - 0 to 3 percent; Bowdle - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Lehr

Surface layer:

0 to 7 inches - very dark grayish brown loam

Subsoil:

7 to 14 inches - dark grayish brown loam

14 to 19 inches - grayish brown, calcareous loam

Underlying layer:

19 to 50 inches - light brownish gray, calcareous gravelly loamy sand

50 to 80 inches - light yellowish brown very gravelly loamy sand

Bowdle

Surface layer:

0 to 10 inches - dark grayish brown loam

Subsoil:

10 to 24 inches - dark grayish brown loam

24 to 29 inches - light brownish gray, calcareous loam

Underlying layer:

29 to 44 inches - light brownish gray, calcareous gravelly loamy sand

44 to 80 inches - light yellowish brown, calcareous very gravelly loamy sand

Soil Properties and Qualities

Drainage class: Lehr - somewhat excessively drained; Bowdle - well drained

Depth to restrictive feature: Lehr - strongly contrasting textural stratification-top depth ranges from 14 to 20 inches; Bowdle - strongly contrasting textural stratification-top depth ranges from 20 to 40 inches

Depth to contrasting parent material: Lehr - 14 to 20 inches over gravelly material; Bowdle - 20 to 40 inches over gravelly material

Depth to high water table: Lehr - greater than 6 feet; Bowdle - greater than 6 feet

Flooding: Lehr - none; Bowdle - none

Ponding: Lehr - none; Bowdle - none

Permeability: Lehr - moderate in the loamy sediments and very rapid in the underlying gravelly material; Bowdle - moderate in the loamy sediments and very rapid in the underlying gravelly material

Available water capacity: Lehr - low; Bowdle - moderate

Organic matter content: Lehr - moderate; Bowdle - moderate

Surface runoff: Lehr - low; Bowdle - low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Straw soils which do not have gravelly material within a depth of 40 inches on high flood plains

Moderately well drained Parshall soils which do not have gravelly material within a depth of 40 inches on footslopes

Use and Management

Cropland

Main crops: Spring wheat, barley, alfalfa, corn, sunflowers, and soybeans

Suitability for cropland: Poorly suited

Management concerns:

Lehr - low available water capacity, agrochemical leaching; Bowdle - moderate available water capacity, agrochemical leaching

Management measures:

These soils are better suited to early-maturing crops such as small grains.

Minimizing tillage and leaving crop residue on the surface help to conserve moisture.

Timing nitrogen application close to the time crops will use it shortens the time available for leaching. Proper pesticide application is critical.

Interpretive Groups

Land capability classification: Lehr - IVs; Bowdle - IIIs

Ecological site: Lehr - Shallow Gravel; Bowdle - Loamy

Conservation tree and shrub group: Lehr - 6G; Bowdle - 6G

Forage suitability group: Lehr - Very Droughty Loam; Bowdle - Droughty Loam

LrB—Lehr-Bowdle loams, 3 to 6 percent slopes

Composition

Lehr and similar soils: 55 to 65 percent

Bowdle and similar soils: 25 to 35 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Outwash plains

Landform position: Lehr - summits and backslopes; Bowdle - footslopes

Slope range: Lehr - 3 to 6 percent; Bowdle - 2 to 6 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Lehr

Surface layer:

0 to 7 inches - very dark grayish brown loam

Subsoil:

7 to 14 inches - dark grayish brown loam

14 to 19 inches - grayish brown, calcareous loam

Underlying layer

19 to 50 inches - light brownish gray, calcareous gravelly loamy sand

50 to 80 inches - light yellowish brown very gravelly loamy sand

Bowdle

Surface layer:

0 to 10 inches - dark grayish brown loam

Subsoil:

10 to 24 inches - dark grayish brown loam

24 to 29 inches - light brownish gray, calcareous loam

Underlying layer:

29 to 44 inches - light brownish gray, calcareous gravelly loamy sand

44 to 80 inches - light yellowish brown, calcareous very gravelly loamy sand

Soil Properties and Qualities

Drainage class: Lehr - somewhat excessively drained; Bowdle - well drained

Depth to restrictive feature: Lehr - strongly contrasting textural stratification-top depth ranges from 14 to 20 inches; Bowdle - strongly contrasting textural stratification-top depth ranges from 20 to 40 inches

Depth to contrasting parent material: Lehr - 14 to 20 inches over gravelly material; Bowdle - 20 to 40 inches over gravelly material

Depth to high water table: Lehr - greater than 6 feet; Bowdle - greater than 6 feet

Flooding: Lehr - none; Bowdle - none

Ponding: Lehr - none; Bowdle - none

Permeability: Lehr - moderate in the loamy sediments and very rapid in the underlying gravelly material; Bowdle - moderate in the loamy sediments and very rapid in the underlying gravelly material

Available water capacity: Lehr - low; Bowdle - moderate

Organic matter content: Lehr - moderate; Bowdle - moderate

Surface runoff: Lehr - medium; Bowdle - medium

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Straw soils which do not have gravelly material within a depth of 40 inches on high flood plains

Moderately well drained Parshall soils which do not have gravelly material within a depth of 40 inches on footslopes

Use and Management

Cropland

Main crops: Spring wheat, barley, alfalfa, corn, sunflowers, and soybeans

Suitability for cropland: Poorly suited

Management concerns:

Lehr - water erosion, low available water capacity, agrochemical leaching;
 Bowdle - water erosion, moderate available water capacity, agrochemical leaching

Management measures:

These soils are better suited to early-maturing crops such as small grains.
 Minimizing tillage and leaving crop residue on the surface help to conserve moisture and control water erosion.
 Timing nitrogen application close to the time crops will use it shortens the time available for leaching. Proper pesticide application is critical.

Interpretive Groups

Land capability classification: Lehr - IVe; Bowdle - IIIe

Ecological site: Lehr - Shallow Gravel; Bowdle - Loamy

Conservation tree and shrub group: Lehr - 6G; Bowdle - 6G

Forage suitability group: Lehr - Very Droughty Loam; Bowdle - Droughty Loam

Ls—Lowe loam, 0 to 1 percent slopes**Composition**

Lowe and similar soils: 80 to 90 percent
 Contrasting inclusions: 10 to 20 percent

Setting

Landform: Flood plains
Landform position: Low flood plains
Slope range: 0 to 1 percent
Shape of areas: Irregular
Size of areas: 10 to 100 acres

Typical Profile**Surface layer:**

0 to 7 inches - dark gray, calcareous loam

Subsoil:

7 to 16 inches - gray, calcareous loam
 16 to 34 inches - light gray, calcareous loam with redox concentrations

Underlying layer:

34 to 50 inches - light gray, calcareous clay loam with redox concentrations
 50 to 80 inches - light gray, stratified calcareous loam and fine sandy loam with redox concentrations

Soil Properties and Qualities

Drainage class: Poorly drained
Depth to restrictive feature: None
Depth to contrasting parent material: Greater than 60 inches
Depth to high water table: 0 to 1.5 feet
Flooding: Occasional for brief periods
Ponding: None
Permeability: Moderate
Available water capacity: High
Organic matter content: High
Surface runoff: Very low

Inclusions

Contrasting inclusions: (May have significant management concerns)

- Somewhat poorly drained Lamoure soils which have more silt and less sand on low flood plains
- Somewhat poorly drained Moritz soils on high flood plains
- Somewhat poorly drained Ranslo soils which have a sodium-affected subsoil on high flood plains

Use and Management

Cropland

- Main crops: Corn, soybeans, sunflowers, and spring wheat
- Suitability for cropland: Poorly suited

Management concerns:

- Flooding, high water table, wind erosion, high content of lime adversely affects the availability of plant nutrients

Management measures:

- The soil is better suited to late-planted crops.
- Leaving crop residue on the surface and deferring tillage when the soil is wet help to maintain tilth, control wind erosion, and limit compaction.
- Rotations including grasses and legumes help to control wind erosion and maintain organic matter content and tilth.

Interpretive Groups

Land capability classification: IVw

Ecological site: Subirrigated

Conservation tree and shrub group: 10

Forage suitability group: Wet

Lt—Ludden silty clay, 0 to 1 percent slopes

Composition

- Ludden and similar soils: 80 to 90 percent
- Contrasting inclusions: 10 to 20 percent

Setting

Landform: Flood plains

Landform position: Low flood plains

Slope range: 0 to 1 percent

Shape of areas: Long and narrow

Size of areas: 10 to 100 acres

Typical Profile

Surface layer:

- 0 to 14 inches - very dark gray, calcareous silty clay

Subsoil:

- 14 to 26 inches - dark gray, calcareous clay
- 26 to 41 inches - gray, calcareous clay with nests of gypsum
- 41 to 52 inches - gray, calcareous silty clay with nests of gypsum and redox depletions

Underlying layer:

- 52 to 80 inches - light gray, calcareous silty clay with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Poorly drained
Depth to restrictive feature: None
Depth to contrasting parent material: Greater than 60 inches
Depth to high water table: 0 to 1.5 feet
Flooding: Frequent for long periods
Ponding: None
Permeability: Slow
Available water capacity: High
Organic matter content: High
Surface runoff: Very low

Inclusions

Contrasting inclusions: (May have significant management concerns)
Somewhat poorly drained Lamoure soils which have more silt and less clay on low flood plains
Poorly drained Playmoor soils which have visible salts throughout and contain less clay on low flood plains

Use and Management

Cropland

Main crops: Corn, soybeans, sunflowers, and spring wheat
Suitability for cropland: Poorly suited

Management concerns:

Flooding, high water table, wind erosion, slow permeability, and surface compaction

Management measures:

In most years the soil is better suited to late-planted crops.
Leaving crop residue on the surface and deferring tillage when the soil is wet help to maintain tilth, control wind erosion, and limit compaction.
Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: IVw
Ecological site: Wet Land
Conservation tree and shrub group: 10
Forage suitability group: Wet

Lu—Ludden silty clay, ponded

Composition

Ludden and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Flood plains
Landform position: Low flood plains
Slope range: 0 to 1 percent
Shape of areas: Long and narrow
Size of areas: 10 to 100 acres

Typical Profile

Surface layer:

0 to 14 inches - very dark gray, calcareous silty clay

Subsoil:

14 to 26 inches - dark gray, calcareous clay

26 to 41 inches - gray, calcareous clay with nests of gypsum

41 to 52 inches - gray, calcareous silty clay with nests of gypsum and redox depletions

Underlying layer:

52 to 80 inches - light gray, calcareous silty clay with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Very poorly drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: Plus 2 to 1 foot

Flooding: Frequent for very long periods

Ponding: Frequent for very long periods

Permeability: Slow

Available water capacity: High

Organic matter content: High

Surface runoff: Negligible

Inclusions

Contrasting inclusions: (May have significant management concerns)

Poorly drained Playmoor soils which have visible salts throughout on low flood plains

Use and Management

Wildlife habitat

Main crops: Unsited

Suitability for cropland: Unsited

Management concerns:

Ponding, high water table, wind erosion, slow permeability, and surface compaction

Management measures:

Maintain area for wildlife habitat.

Interpretive Groups

Land capability classification: VIIIw

Ecological site: Not Assigned

Conservation tree and shrub group: 10

Forage suitability group: Not Suited

Lw—Ludden silty clay, wet, 0 to 1 percent slopes

Composition

Ludden and similar soils: 80 to 90 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Flood plains

Landform position: Low flood plains

Slope range: 0 to 1 percent

Shape of areas: Long and narrow

Size of areas: 10 to 100 acres

Typical Profile

Surface layer:

0 to 14 inches - very dark gray, calcareous silty clay

Subsoil:

14 to 26 inches - dark gray, calcareous clay

26 to 41 inches - gray, calcareous clay with nests of gypsum

41 to 52 inches - gray, calcareous silty clay with nests of gypsum and redox depletions

Underlying layer:

52 to 80 inches - light gray, calcareous silty clay with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Very poorly drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: Plus 1 to 1.0 feet

Flooding: Frequent for long periods

Ponding: Frequent for very long periods

Permeability: Slow

Available water capacity: High

Organic matter content: High

Surface runoff: Very low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Somewhat poorly drained Lamoure soils which have more silt and less clay on low flood plains

Poorly drained Playmoor soils which have visible salts throughout on low flood plains

Use and Management

Rangeland

Main crops: Unsited

Suitability for cropland: Generally unsited

Management concerns:

Flooding, high water table, slow permeability, surface compaction

Management measures:

Proper grazing management helps to maintain plant vigor.

Restricting grazing during wet periods helps to limit compaction.

Interpretive Groups

Land capability classification: Vw

Ecological site: Wet Land

Conservation tree and shrub group: 10

Forage suitability group: Not Suited

M-W—Miscellaneous water

Miscellaneous water: Small man-made water areas used for sewage lagoons, industrial, sanitary, or mining applications

MaC—Maddock-Egeland sandy loams, 6 to 9 percent slopes

Composition

Maddock and similar soils: 40 to 60 percent

Egeland and similar soils: 30 to 40 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Outwash plains

Landform position: Maddock - shoulders and backslopes; Egeland - backslopes

Slope range: Maddock - 6 to 9 percent; Egeland - 6 to 9 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Maddock

Surface layer:

0 to 9 inches - dark gray sandy loam

Subsoil:

9 to 22 inches - light yellowish brown, calcareous loamy sand

Underlying layer:

22 to 41 inches - light yellowish brown, calcareous sand

41 to 80 inches - light brownish gray, calcareous sand

Egeland

Surface layer:

0 to 8 inches - dark gray sandy loam

Subsoil:

8 to 14 inches - dark grayish brown sandy loam

14 to 31 inches - grayish brown sandy loam

31 to 46 inches - pale brown, calcareous loamy sand

Underlying layer:

46 to 64 inches - brown, calcareous loamy sand

64 to 80 inches - light brownish gray, calcareous sandy loam with redox concentrations

Soil Properties and Qualities

Drainage class: Maddock - well drained; Egeland - well drained

Depth to restrictive feature: Maddock - none; Egeland - none

Depth to contrasting parent material: Maddock - greater than 60 inches;
Egeland - greater than 60 inches

Depth to high water table: Maddock - greater than 6 feet; Egeland - greater than 6 feet

Flooding: Maddock - none; Egeland - none

Ponding: Maddock - none; Egeland - none

Permeability: Maddock - rapid; Egeland - moderately rapid

Available water capacity: Maddock - low; Egeland - moderate

Organic matter content: Maddock - moderately low; Egeland - moderate

Surface runoff: Maddock - low; Egeland - medium

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Embden soils which are dark to a depth greater than 16 inches on footslopes

Well drained Fordville soils which have gravelly material at a depth of 20 to 40 inches on footslopes

Somewhat excessively drained Renshaw soils which have gravelly material at a depth of 14 to 20 inches on backslopes

Use and Management

Cropland

Main crops: Spring wheat and alfalfa

Suitability for cropland: Poorly suited

Management concerns:

Maddock - water and wind erosion, low available water capacity, agrochemical leaching; Egeland - water and wind erosion, moderate available water capacity, agrochemical leaching

Management measures:

These soils are better suited to early-maturing crops such as small grains.

Minimizing tillage and leaving crop residue on the surface help to control erosion and conserve moisture.

Wind stripcropping and field windbreaks also help to control wind erosion.

Timing nitrogen application close to the time crops will use it shortens the time available for leaching. Proper pesticide application is critical.

Interpretive Groups

Land capability classification: Maddock - IVe; Egeland - IVe

Ecological site: Maddock - Sandy; Egeland - Sandy

Conservation tree and shrub group: Maddock - 5; Egeland - 5

Forage suitability group: Maddock - Very Droughty Loam; Egeland - Droughty Loam

MdA—Max-Arnegard loams, 0 to 3 percent slopes

Composition

Max and similar soils: 45 to 55 percent

Arnegard and similar soils: 35 to 45 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Max - summits and backslopes; Arnegard - footslopes

Slope range: Max - 0 to 3 percent; Arnegard - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Max

Surface layer:

0 to 8 inches - dark grayish brown loam

Subsoil:

8 to 14 inches - dark grayish brown loam

14 to 40 inches - light yellowish brown, calcareous loam

Underlying layer:

40 to 52 inches - light yellowish brown, calcareous loam with relict redox features

52 to 80 inches - light yellowish brown, calcareous loam with redox concentrations

Arnegard

Surface layer:

0 to 8 inches - dark grayish brown loam

Subsoil:

8 to 14 inches - dark grayish brown loam

14 to 19 inches - grayish brown loam

19 to 25 inches - brown loam

25 to 40 inches - pale yellow, calcareous loam with redox concentrations

Underlying layer:

40 to 80 inches - light yellowish brown, calcareous loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Max - well drained; Arnegard - moderately well drained

Depth to restrictive feature: Max - none; Arnegard - none

Depth to contrasting parent material: Max - greater than 60 inches;
Arnegard - greater than 60 inches

Depth to high water table: Max - greater than 6 feet; Arnegard - 3.5 to 5 feet

Flooding: Max - none; Arnegard - none

Ponding: Max - none; Arnegard - none

Permeability: Max - moderately slow; Arnegard - moderate

Available water capacity: Max - high; Arnegard - high

Organic matter content: Max - moderate; Arnegard - high

Surface runoff: Max - low; Arnegard - low

Other properties: Runoff water flows over the Arnegard soil during periods of rainfall or snowmelt.

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Niobell soils which have a sodium-affected subsoil on footslopes

Poorly drained Tonka soils in basins

Well drained Zahl soils which are calcareous to the surface on shoulders

Similar inclusions:

Soils that have more clay in the subsoil than the Max soil

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Well suited

Management concerns:

Few limitations except to conserve moisture

Management measures:

Managing tillage and leaving crop residue conserves moisture and helps to maintain organic matter content and tilth.

Interpretive Groups

Land capability classification: Max - IIc; Arnegard - IIc

Ecological site: Max - Loamy; Arnegard - Loamy Overflow

Conservation tree and shrub group: Max - 3; Arnegard - 1

Forage suitability group: Max - Loam; Arnegard - Overflow

MdB—Max-Arnegard loams, 1 to 6 percent slopes

Composition

Max and similar soils: 50 to 65 percent

Arnegard and similar soils: 25 to 40 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Max - summits and backslopes; Arnegard - footslopes

Slope range: Max - 3 to 6 percent; Arnegard - 1 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Max

Surface layer:

0 to 8 inches - dark grayish brown loam

Subsoil:

8 to 14 inches - dark grayish brown loam

14 to 40 inches - light yellowish brown, calcareous loam

Underlying layer:

40 to 52 inches - light yellowish brown, calcareous loam with relict redox features

52 to 80 inches - light yellowish brown, calcareous loam with redox concentrations

Arnegard

Surface layer:

0 to 8 inches - dark grayish brown loam

Subsoil:

- 8 to 14 inches - dark grayish brown loam
- 14 to 19 inches - grayish brown loam
- 19 to 25 inches - brown loam
- 25 to 40 inches - pale yellow, calcareous loam with redox concentrations

Underlying layer:

- 40 to 80 inches - light yellowish brown, calcareous loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Max - well drained; Arnegard - moderately well drained

Depth to restrictive feature: Max - none; Arnegard - none

Depth to contrasting parent material: Max - greater than 60 inches;
Arnegard - greater than 60 inches

Depth to high water table: Max - greater than 6 feet; Arnegard - 3.5 to 5 feet

Flooding: Max - none; Arnegard - none

Ponding: Max - none; Arnegard - none

Permeability: Max - moderately slow; Arnegard - moderate

Available water capacity: Max - high; Arnegard - high

Organic matter content: Max - moderate; Arnegard - high

Surface runoff: Max - medium; Arnegard - low

Other properties: Runoff water flows over the Arnegard soil during periods of rainfall or snowmelt.

Inclusions**Contrasting inclusions: (May have significant management concerns)**

- Moderately well drained Niobell soils which have a sodium-affected subsoil on footslopes
- Poorly drained Tonka soils in basins
- Well drained Zahl soils which are calcareous to the surface on shoulders

Similar inclusions:

- Soils that have more clay in the subsoil than the Max soil

Use and Management**Cropland**

- Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers
- Suitability for cropland: Well suited

Management concerns:

- Max - water erosion; Arnegard - few limitations except to conserve moisture

Management measures:

- Minimizing tillage and leaving crop residue on the surface help to control erosion and conserve moisture.
- Contour farming and grassed waterways also help to control water erosion, but slopes in most areas are too short or too irregular for contouring.

Interpretive Groups

Land capability classification: Max - IIe; Arnegard - IIc

Ecological site: Max - Loamy; Arnegard - Loamy Overflow

Conservation tree and shrub group: Max - 3; Arnegard - 1

Forage suitability group: Max - Loam; Arnegard - Overflow

MgB—Max-Arnegard-Zahl loams, 1 to 6 percent slopes

Composition

Max and similar soils: 40 to 50 percent
Arnegard and similar soils: 25 to 35 percent
Zahl and similar soils: 15 to 25 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Max - summits and backslopes; Arnegard - footslopes;
Zahl - shoulders

Slope range: Max - 3 to 6 percent; Arnegard - 1 to 2 percent; Zahl - 3 to 6 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Max

Surface layer:

0 to 8 inches - dark grayish brown loam

Subsoil:

8 to 14 inches - dark grayish brown loam

14 to 40 inches - light yellowish brown, calcareous loam

Underlying layer:

40 to 52 inches - light yellowish brown, calcareous loam with relict redox features

52 to 80 inches - light yellowish brown, calcareous loam with redox concentrations

Arnegard

Surface layer:

0 to 8 inches - dark grayish brown loam

Subsoil:

8 to 14 inches - dark grayish brown loam

14 to 19 inches - grayish brown loam

19 to 25 inches - brown loam

25 to 40 inches - pale yellow, calcareous loam with redox concentrations

Underlying layer:

40 to 80 inches - light yellowish brown, calcareous loam with redox concentrations and depletions

Zahl

Surface layer:

0 to 8 inches - dark grayish brown, calcareous loam

Subsoil:

8 to 19 inches - pale yellow, calcareous loam

19 to 29 inches - pale yellow, calcareous clay loam

Underlying layer:

29 to 80 inches - pale yellow, calcareous clay loam with relict redox features

Soil Properties and Qualities

Drainage class: Max - well drained; Arnegard - moderately well drained; Zahl - well drained

Depth to restrictive feature: Max - none; Arnegard - none; Zahl - none

Depth to contrasting parent material: Max - greater than 60 inches;
Arnegard - greater than 60 inches; Zahl - greater than 60 inches

Depth to high water table: Max - greater than 6 feet; Arnegard - 3.5 to 5 feet;
Zahl - greater than 6 feet

Flooding: Max - none; Arnegard - none; Zahl - none

Ponding: Max - none; Arnegard - none; Zahl - none

Permeability: Max - moderately slow; Arnegard - moderate; Zahl - moderately slow

Available water capacity: Max - high; Arnegard - high; Zahl - high

Organic matter content: Max - moderate; Arnegard - high; Zahl - moderately low

Surface runoff: Max - medium; Arnegard - low; Zahl - medium

Other properties: Runoff water flows over the Arnegard soil during periods of rainfall or snowmelt.

Inclusions**Contrasting inclusions:**

Moderately well drained Niobell soils which have a sodium-affected subsoil on footslopes

Poorly drained Tonka soils in basins

Similar inclusions:

Soils that have more clay in the subsoil than the Max soil

Use and Management**Cropland**

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Max - water erosion; Arnegard - few limitations except to conserve moisture;
Zahl - water and wind erosion, high content of lime adversely affects the availability of plant nutrients

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control erosion and conserve moisture.

Contour farming and grassed waterways also help to control water erosion, but slopes in most areas are too short or too irregular for contouring.

Applying animal wastes, especially on the Zahl soil, helps maintain fertility.

Rotations including grasses and legumes help to control erosion and maintain fertility, organic matter content, and tilth.

Interpretive Groups

Land capability classification: Max - IIe; Arnegard - IIc; Zahl - IIIe

Ecological site: Max - Loamy; Arnegard - Loamy Overflow; Zahl - Thin Loamy

Conservation tree and shrub group: Max - 3; Arnegard - 1; Zahl - 8K

Forage suitability group: Max - Loam; Arnegard - Overflow; Zahl - Limy Upland

MnB—Max-Niobell-Noonan loams, 2 to 6 percent slopes

Composition

Max and similar soils: 35 to 50 percent
Niobell and similar soils: 25 to 35 percent
Noonan and similar soils: 15 to 25 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Max - summits; Niobell - backslopes; Noonan - footslopes

Slope range: Max - 3 to 6 percent; Niobell - 2 to 6 percent; Noonan - 2 to 6 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Max

Surface layer:

0 to 8 inches - dark grayish brown loam

Subsoil:

8 to 14 inches - dark grayish brown loam

14 to 40 inches - light yellowish brown, calcareous loam

Underlying layer:

40 to 52 inches - light yellowish brown, calcareous loam with relict redox features

52 to 80 inches - light yellowish brown, calcareous loam with redox concentrations

Niobell

Surface layer:

0 to 7 inches - dark grayish brown loam

Transitional layer:

7 to 12 inches - grayish brown and light brownish gray loam

Subsoil:

12 to 16 inches - grayish brown clay loam

16 to 28 inches - brown clay loam

28 to 42 inches - light gray, calcareous clay loam with masses of salt and crystals of gypsum

Underlying layer:

42 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Noonan

Surface layer:

0 to 6 inches - dark grayish brown loam

Subsurface layer:

6 to 8 inches - light brownish gray loam

Subsoil:

8 to 18 inches - grayish brown clay loam

18 to 31 inches - light yellowish brown, calcareous clay loam with masses of salt and nests of gypsum

Underlying layer:

31 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Max - well drained; Niobell - moderately well drained; Noonan - moderately well drained

Depth to restrictive feature: Max - none; Niobell - none; Noonan - natric-top depth ranges from 5 to 10 inches

Depth to contrasting parent material: Max - greater than 60 inches; Niobell - greater than 60 inches; Noonan - greater than 60 inches

Depth to high water table: Max - greater than 6 feet; Niobell - 3.5 to 5 feet; Noonan - 3.5 to 5 feet

Flooding: Max - none; Niobell - none; Noonan - none

Ponding: Max - none; Niobell - none; Noonan - none

Permeability: Max - moderately slow; Niobell - slow; Noonan - very slow

Available water capacity: Max - high; Niobell - high; Noonan - moderate

Organic matter content: Max - moderate; Niobell - moderate; Noonan - moderate

Surface runoff: Max - medium; Niobell - medium; Noonan - medium

Inclusions**Contrasting inclusions:**

Moderately well drained Arnegard soils which do not have a sodium-affected subsoil and are dark to a depth greater than 16 inches on footslopes

Poorly drained Rimlap soils on the outer part and in the center of basins

Poorly drained Tonka soils in the center of basins

Well drained Zahl soils which are calcareous to the surface on shoulders

Similar inclusions:

Soils that have more clay in the subsoil than the Max soil

Soils that have less clay in the subsoil than the Niobell and Noonan soils

Use and Management**Cropland**

Main crops: Spring wheat, alfalfa, sunflowers, corn, and soybeans

Suitability for cropland: Fairly well suited

Management concerns:

Max - water erosion; Niobell - water erosion, slow permeability; Noonan - water erosion, sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to control water erosion, conserve moisture, and maintain organic matter content and tilth.

Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Max - IIe; Niobell - IIIe; Noonan - IVs

Ecological site: Max - Loamy; Niobell - Clayey; Noonan - Claypan

Conservation tree and shrub group: Max - 3; Niobell - 4; Noonan - 9C

Forage suitability group: Max - Loam; Niobell - Clayey Subsoil; Noonan - Claypan

MxC—Max-Zahl-Arnegard loams, 2 to 9 percent slopes

Composition

Max and similar soils: 40 to 50 percent
Zahl and similar soils: 25 to 40 percent
Arnegard and similar soils: 15 to 25 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Max - backslopes; Zahl - shoulders; Arnegard - footslopes

Slope range: Max - 6 to 9 percent; Zahl - 6 to 9 percent; Arnegard - 2 to 6 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Max

Surface layer:

0 to 8 inches - dark grayish brown loam

Subsoil:

8 to 14 inches - dark grayish brown loam

14 to 40 inches - light yellowish brown, calcareous loam

Underlying layer:

40 to 52 inches - light yellowish brown, calcareous loam with relict redox features

52 to 80 inches - light yellowish brown, calcareous loam with redox concentrations

Zahl

Surface layer:

0 to 8 inches - dark grayish brown, calcareous loam

Subsoil:

8 to 19 inches - pale yellow, calcareous loam

19 to 29 inches - pale yellow, calcareous clay loam

Underlying layer:

29 to 80 inches - pale yellow, calcareous clay loam with relict redox features

Arnegard

Surface layer:

0 to 8 inches - dark grayish brown loam

Subsoil:

8 to 14 inches - dark grayish brown loam

14 to 19 inches - grayish brown loam

19 to 25 inches - brown loam

25 to 40 inches - pale yellow, calcareous loam with redox concentrations

Underlying layer:

40 to 80 inches - light yellowish brown, calcareous loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Max - well drained; Zahl - well drained; Arnegard - well drained
Depth to restrictive feature: Max - none; Zahl - none; Arnegard - none
Depth to contrasting parent material: Max - greater than 60 inches; Zahl - greater than 60 inches; Arnegard - greater than 60 inches
Depth to high water table: Max - greater than 6 feet; Zahl - greater than 6 feet; Arnegard - 4 to 6 feet
Flooding: Max - none; Zahl - none; Arnegard - none
Ponding: Max - none; Zahl - none; Arnegard - none
Permeability: Max - moderately slow; Zahl - moderately slow; Arnegard - moderate
Available water capacity: Max - high; Zahl - high; Arnegard - high
Organic matter content: Max - moderate; Zahl - moderately low; Arnegard - high
Surface runoff: Max - medium; Zahl - medium; Arnegard - medium
Other properties: Runoff water flows over the Arnegard soil during period of rainfall or snowmelt.

Inclusions

Contrasting inclusions:

Poorly drained Tonka soils in basins

Similar inclusions:

Soils that have a thinner surface layer than the Zahl soil

Use and Management

Cropland

Main crops: Spring wheat, alfalfa, corn, soybeans, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Max - water erosion; Zahl - water and wind erosion, high content of lime which adversely affects the availability of plant nutrients; Arnegard - water erosion

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control erosion and conserve moisture.

Contour farming, terraces, and grassed waterways also help to control water erosion, but slopes in most areas are too short or too irregular for contouring or terracing.

Applying animal wastes, especially on the Zahl soil, helps maintain fertility.

Rotations including grasses and legumes help to control erosion and maintain fertility, organic matter content, and tilth.

Interpretive Groups

Land capability classification: Max - IIIe; Zahl - IVe; Arnegard - IIe

Ecological site: Max - Loamy; Zahl - Thin Loamy; Arnegard - Loamy

Conservation tree and shrub group: Max - 3; Zahl - 8K; Arnegard - 1

Forage suitability group: Max - Loam; Zahl - Limy Upland; Arnegard - Loam

My—Miranda-Heil complex, 0 to 2 percent slopes

Composition

Miranda and similar soils: 45 to 55 percent

Heil and similar soils: 30 to 45 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Miranda - footslopes; Heil - basins

Slope range: Miranda - 0 to 2 percent; Heil - 0 to 1 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Miranda

Surface layer:

0 to 3 inches - gray loam

Subsoil:

3 to 13 inches - dark gray clay loam

13 to 17 inches - grayish brown clay loam with masses of salt and nests of gypsum

17 to 32 inches - light yellowish brown, calcareous clay loam with masses of salt, nests of gypsum, with redox concentrations and depletions

Underlying layer:

32 to 63 inches - light gray, calcareous clay loam with redox concentrations and depletions

63 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Heil

Surface layer:

0 to 2 inches - gray silt loam with redox concentrations

Subsoil:

2 to 24 inches - dark gray silty clay with masses of salt and crystals of gypsum in the lower part

24 to 39 inches - gray, calcareous silty clay loam with masses of salt and crystals of gypsum

39 to 47 inches - light brownish gray, calcareous silty clay loam with masses of salt, crystals of gypsum, and redox concentrations and depletions

Underlying layer:

47 to 80 inches - pale olive, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Miranda - somewhat poorly drained; Heil - poorly drained

Depth to restrictive feature: Miranda - natric-top depth ranges from 0 to 5 inches;
Heil - natric-top depth ranges from 1 to 4 inches

Depth to contrasting parent material: Miranda - greater than 60 inches;
Heil - greater than 40 inches over glacial till

Depth to high water table: Miranda - 1.5 to 3.5 feet; Heil - plus 1 to 1.5 feet

Flooding: Miranda - none; Heil - none

Ponding: Miranda - none; Heil - frequent for long periods

Permeability: Miranda - very slow; Heil - very slow

Available water capacity: Miranda - moderate; Heil - moderate

Organic matter content: Miranda - moderately low; Heil - moderate

Surface runoff: Miranda - low; Heil - negligible

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Niobell and Noonan soils which do not have visible salts within a depth of 16 inches (Niobell soils have less exchangeable sodium than the Nahon soils) on footslopes

Similar inclusions:

Soils that have a thicker surface layer than the Heil soil

Use and Management

Rangeland

Main crops: Unsuit

Suitability for cropland: Unsuit

Management concerns:

Miranda - sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability;
Heil - ponding, high water table, sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability

Management measures:

Proper grazing management helps to maintain plant vigor.
Restricting grazing during wet periods helps to limit compaction.
Seed cultivated areas to adapted species.

Interpretive Groups

Land capability classification: Miranda - VIs; Heil - VIs

Ecological site: Miranda - Thin Claypan; Heil - Closed Depression

Conservation tree and shrub group: Miranda - 10; Heil - 10

Forage suitability group: Miranda - Not Suited; Heil - Not Suited

Mz—Moritz-Lowe loams, 0 to 2 percent slopes

Composition

Moritz and similar soils: 50 to 65 percent

Lowe and similar soils: 30 to 45 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Flood plains

Landform position: Moritz - microhighs; Lowe - microlows

Slope range: Moritz - 0 to 2 percent; Lowe - 0 to 1 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Moritz

Surface layer:

0 to 7 inches - very dark gray, calcareous loam

Subsurface layer:

7 to 12 inches - dark gray, calcareous loam

Subsoil:

- 12 to 20 inches - light brownish gray, calcareous loam
- 20 to 34 inches - light olive brown, calcareous loam
- 34 to 44 inches - grayish brown, calcareous loam with redox concentrations

Underlying layer:

- 44 to 54 inches - grayish brown, calcareous loam with redox concentrations
- 54 to 80 inches - light olive brown, stratified calcareous loamy sand and loam with redox concentrations

Lowe**Surface layer:**

- 0 to 7 inches - dark gray, calcareous loam

Subsoil:

- 7 to 16 inches - gray, calcareous loam
- 16 to 34 inches - light gray, calcareous loam with redox concentrations

Underlying layer:

- 34 to 50 inches - light gray, calcareous clay loam with redox concentrations
- 50 to 80 inches - light gray, stratified calcareous loam and fine sandy loam with redox concentrations

Soil Properties and Qualities

Drainage class: Moritz - somewhat poorly drained; Lowe - poorly drained

Depth to restrictive feature: Moritz - none; Lowe - none

Depth to contrasting parent material: Moritz - greater than 60 inches;
Lowe - greater than 60 inches

Depth to high water table: Moritz - 1.5 to 3 feet; Lowe - 0 to 1.5 feet

Flooding: Moritz - rare for brief periods; Lowe - occasional for brief periods

Ponding: Moritz - none; Lowe - none

Permeability: Moritz - moderate; Lowe - moderate

Available water capacity: Moritz - high; Lowe - high

Organic matter content: Moritz - moderate; Lowe - high

Surface runoff: Moritz - low; Lowe - very low

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Moderately well drained La Prairie soils which are not calcareous to the surface on high flood plains

Somewhat poorly drained Lamoure soils which have more silt and less sand on low flood plains

Somewhat poorly drained Ranslo soils which have a sodium-affected subsoil on low flood plains

Use and Management**Cropland**

Main crops: Corn, soybeans, sunflowers, and spring wheat

Suitability for cropland: Fairly well suited

Management concerns:

Moritz - wind erosion, high content of lime adversely affects the availability of plant nutrients; Lowe - flooding, high water table, wind erosion, high content of lime adversely affects the availability of plant nutrients

Management measures:

In most years the soils are better suited to late-planted crops.

Leaving crop residue on the surface and deferring tillage when the soils are wet help to maintain tilth, control wind erosion, and limit compaction.

Rotations including grasses and legumes help to control erosion and maintain organic matter content and tilth.

Interpretive Groups

Land capability classification: Moritz - IIe; Lowe - IVw

Ecological site: Moritz - Limy Subirrigated; Lowe - Subirrigated

Conservation tree and shrub group: Moritz - 2KK; Lowe - 10

Forage suitability group: Moritz - Subirrigated; Lowe - Wet

Na—Nahon-Aberdeen-Exline silt loams, 0 to 2 percent slopes

Composition

Nahon and similar soils: 40 to 55 percent

Aberdeen and similar soils: 25 to 40 percent

Exline and similar soils: 15 to 25 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Nahon - footslopes; Aberdeen - summits and backslopes;
Exline - lower footslopes

Slope range: Nahon - 0 to 2 percent; Aberdeen - 0 to 2 percent; Exline - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 20 to 200 acres

Typical Profile

Nahon

Surface layer:

0 to 7 inches - dark gray silt loam

Subsurface layer:

7 to 9 inches - gray silt loam

Subsoil:

9 to 24 inches - dark grayish brown silty clay

24 to 36 inches - light yellowish brown, calcareous silty clay loam with masses of salt and crystals of gypsum

Underlying layer:

36 to 46 inches - light gray, calcareous, varved silty clay loam with redox depletions

46 to 80 inches - pale yellow, calcareous, varved silty clay loam with redox depletions

Aberdeen

Surface layer:

0 to 8 inches - dark gray silt loam

Transitional layer:

8 to 13 inches - gray silty clay loam

Subsoil:

13 to 23 inches - dark gray silty clay

23 to 31 inches - grayish brown, calcareous silty clay loam with masses of salt and crystals of gypsum

31 to 39 inches - light brownish gray, calcareous silty clay loam with masses of salt and crystals of gypsum

Underlying layer:

39 to 80 inches - pale yellow, varved calcareous silty clay loam with redox concentrations and depletions

Exline

Surface layer:

0 to 2 inches - gray silt loam

Subsoil:

2 to 12 inches - dark gray silty clay

12 to 21 inches - grayish brown silty clay with masses of salt and nests of gypsum

21 to 40 inches - light brownish gray, calcareous silty clay loam with masses of salt and nests of gypsum in the upper part

Underlying layer:

40 to 56 inches - light gray, calcareous, varved silt loam with redox concentrations and depletions

56 to 80 inches - pale yellow, calcareous, varved silt loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Nahon - moderately well drained; Aberdeen - moderately well drained; Exline - somewhat poorly drained

Depth to restrictive feature: Nahon - natric-top depth ranges from 6 to 17 feet; Aberdeen - none; Exline - natric-top depth ranges from 0 to 6 feet

Depth to contrasting parent material: Nahon - greater than 60 inches; Aberdeen - greater than 60 inches; Exline - greater than 60 inches

Depth to high water table: Nahon - 3.5 to 5 feet; Aberdeen - 3.5 to 5 feet; Exline - 1.5 to 3.5 feet

Flooding: Nahon - none; Aberdeen - none; Exline - none

Ponding: Nahon - none; Aberdeen - none; Exline - none

Permeability: Nahon - very slow; Aberdeen - slow; Exline - very slow

Available water capacity: Nahon - moderate; Aberdeen - high; Exline - moderate

Organic matter content: Nahon - moderate; Aberdeen - moderate; Exline - moderately low

Surface runoff: Nahon - low; Aberdeen - low; Exline - low

Inclusions

Contrasting inclusions:

Moderately well drained Harmony soils which do not have a sodium-affected subsoil on lower backslopes

Poorly drained Heil soils in basins

Use and Management

Cropland

Main crops: Nahon and Aberdeen - barley, spring wheat, alfalfa, and sunflowers; Exline - unsuited

Suitability for cropland: Generally unsuited

Management concerns:

Nahon and Exline - sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability;
Aberdeen - slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.
Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Nahon - IVs; Aberdeen - IIIs; Exline - VIs

Ecological site: Nahon - Claypan; Aberdeen - Clayey; Exline - Thin Claypan

Conservation tree and shrub group: Nahon - 9C; Aberdeen - 4; Exline - 10

Forage suitability group: Nahon - Claypan; Aberdeen - Clayey Subsoil;
Exline - Not Suited

**Nb—Nahon-Aberdeen-Exline silt loams, till substratum,
0 to 2 percent slopes****Composition**

Nahon and similar soils: 40 to 55 percent
Aberdeen and similar soils: 25 to 40 percent
Exline and similar soils: 15 to 25 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Nahon - footslopes; Aberdeen - summits and backslopes;
Exline - lower footslopes

Slope range: Nahon - 0 to 2 percent; Aberdeen - 0 to 2 percent; Exline - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 20 to 200 acres

Typical Profile**Nahon****Surface layer:**

0 to 7 inches - dark gray silt loam

Subsurface layer:

7 to 9 inches - gray silt loam

Subsoil:

9 to 15 inches - dark gray silty clay

15 to 21 inches - grayish brown silty clay

21 to 32 inches - light gray, calcareous silty clay loam with masses of salt and crystals of gypsum

32 to 43 inches - pale yellow, calcareous silty clay loam

Underlying layer:

43 to 49 inches - light yellowish brown, calcareous, varved silt loam with redox depletions

49 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Aberdeen

Surface layer:

0 to 6 inches - dark gray silt loam

Transitional layer:

6 to 11 inches - gray silty clay loam

Subsoil:

11 to 17 inches - dark gray silty clay

17 to 23 inches - grayish brown silty clay

23 to 36 inches - light gray, calcareous silty clay loam

Underlying layer:

36 to 49 inches - pale yellow, calcareous, varved silty clay loam

49 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Exline

Surface layer:

0 to 2 inches - gray silt loam

Subsoil:

2 to 14 inches - dark gray silty clay

14 to 24 inches - grayish brown silty clay with masses of salt and nests of gypsum

24 to 39 inches - light gray, calcareous silty clay loam with masses of salt and nests of gypsum in the upper part

Underlying layer:

39 to 55 inches - pale yellow, calcareous, varved silty clay loam and silt loam with redox concentrations and depletions

55 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Nahon - moderately well drained; Aberdeen - moderately well drained; Exline - somewhat poorly drained

Depth to restrictive feature: Nahon - natric-top depth ranges from 6 to 17 inches; Aberdeen - none; Exline - natric-top depth ranges from 0 to 6 inches

Depth to contrasting parent material: Nahon - greater than 40 inches over glacial till; Aberdeen - greater than 40 inches over glacial till; Exline - greater than 40 inches over glacial till

Depth to high water table: Nahon - 3.5 to 5 feet; Aberdeen - 3.5 to 5 feet; Exline - 1.5 to 3.5 feet

Flooding: Nahon - none; Aberdeen - none; Exline - none

Ponding: Nahon - none; Aberdeen - none; Exline - none

Permeability: Nahon - very slow; Aberdeen - slow; Exline - very slow

Available water capacity: Nahon - moderate; Aberdeen - high; Exline - moderate

Organic matter content: Nahon - moderate; Aberdeen - moderate; Exline - moderately low

Surface runoff: Nahon - low; Aberdeen - low; Exline - low

Inclusions

Contrasting inclusions:

- Moderately well drained Harmony soils which do not have a sodium-affected subsoil on lower backslopes
- Poorly drained Heil soils in basins

Similar inclusions:

- Soils that are less than 40 inches to loamy glacial till
- Soils that are greater than 60 inches to loamy glacial till

Use and Management

Cropland

- Main crops: Nahon and Aberdeen - barley, spring wheat, alfalfa, and sunflowers;
- Exline - unsuited
- Suitability for cropland: Poorly suited

Management concerns:

- Nahon and Exline - sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability;
- Aberdeen - slow permeability

Management measures:

- Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.
- Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Nahon - IVs; Aberdeen - IIIs; Exline - VIs

Ecological site: Nahon - Claypan; Aberdeen - Clayey; Exline - Thin Claypan

Conservation tree and shrub group: Nahon - 9C; Aberdeen - 4; Exline - 10

Forage suitability group: Nahon - Claypan; Aberdeen - Clayey Subsoil;
Exline - Not Suited

Nc—Niobell-Noonan loams, 0 to 2 percent slopes

Composition

- Niobell and similar soils: 50 to 65 percent
- Noonan and similar soils: 25 to 35 percent
- Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Niobell - summits and backslopes; Noonan - footslopes

Slope range: Niobell - 0 to 2 percent; Noonan - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Niobell**Surface layer:**

- 0 to 7 inches - dark grayish brown loam

Transitional layer:

7 to 12 inches - grayish brown and light brownish gray loam

Subsoil:

12 to 16 inches - grayish brown clay loam

16 to 28 inches - brown clay loam

28 to 42 inches - light gray, calcareous clay loam with masses of salt and crystals of gypsum

Underlying layer:

42 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Noonan**Surface layer:**

0 to 6 inches - dark grayish brown loam

Subsurface layer:

6 to 8 inches - light brownish gray loam

Subsoil:

8 to 18 inches - grayish brown clay loam

18 to 31 inches - light yellowish brown, calcareous clay loam with masses of salt and nests of gypsum

Underlying layer:

31 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Niobell - moderately well drained; Noonan - moderately well drained

Depth to restrictive feature: Niobell - none; Noonan - natric-top depth ranges from 5 to 10 inches

Depth to contrasting parent material: Niobell - greater than 60 inches; Noonan - greater than 60 inches

Depth to high water table: Niobell - 3.5 to 5 feet; Noonan - 3.5 to 5 feet

Flooding: Niobell - none; Noonan - none

Ponding: Niobell - none; Noonan - none

Permeability: Niobell - slow; Noonan - very slow

Available water capacity: Niobell - high; Noonan - moderate

Organic matter content: Niobell - moderate; Noonan - moderate

Surface runoff: Niobell - low; Noonan - low

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Poorly drained Heil soils in basins

Moderately well drained Miranda soils which have visible salts within a depth of 16 inches in micro-depressions

Well drained Williams soils which do not have a sodium-affected subsoil on backslopes

Use and Management**Cropland**

Main crops: Spring wheat, barley, alfalfa, sunflowers, corn, and soybeans

Suitability for cropland: Poorly suited

Management concerns:

Niobell - slow permeability; Noonan - sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.

Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Niobell - IIIs; Noonan - IVs

Ecological site: Niobell - Clayey; Noonan - Claypan

Conservation tree and shrub group: Niobell - 4; Noonan - 9C

Forage suitability group: Niobell - Clayey Subsoil; Noonan - Claypan

Nd—Niobell-Noonan-Heil complex, 0 to 2 percent slopes**Composition**

Niobell and similar soils: 35 to 45 percent

Noonan and similar soils: 25 to 35 percent

Heil and similar soils: 15 to 25 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Niobell - summits and backslopes; Noonan - footslopes;
Heil - basins

Slope range: Niobell - 0 to 2 percent; Noonan - 0 to 2 percent; Heil - 0 to 1 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile**Niobell****Surface layer:**

0 to 7 inches - dark grayish brown loam

Transitional layer:

7 to 12 inches - grayish brown and light brownish gray loam

Subsoil:

12 to 16 inches - grayish brown clay loam

16 to 28 inches - brown clay loam

28 to 42 inches - light gray, calcareous clay loam with masses of salt and crystals of gypsum

Underlying layer:

42 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Noonan**Surface layer:**

0 to 6 inches - dark grayish brown loam

Subsurface layer:

6 to 8 inches - light brownish gray loam

Subsoil:

8 to 18 inches - grayish brown clay loam

18 to 31 inches - light yellowish brown, calcareous clay loam with masses of salt and nests of gypsum

Underlying layer:

31 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Heil**Surface layer:**

0 to 2 inches - gray silt loam with redox concentrations

Subsoil:

2 to 24 inches - dark gray silty clay with masses of salt and crystals of gypsum in the lower part

24 to 39 inches - gray, calcareous silty clay loam with masses of salt and crystals of gypsum

39 to 47 inches - light brownish gray, calcareous silty clay loam with masses of salt, crystals of gypsum, and redox concentrations and depletions

Underlying layer:

47 to 80 inches - pale olive, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Niobell - moderately well drained; Noonan - moderately well drained; Heil - poorly drained

Depth to restrictive feature: Niobell - none; Noonan - natric-top depth ranges from 5 to 10 inches; Heil - natric-top depth ranges from 1 to 4 inches

Depth to contrasting parent material: Niobell - greater than 60 inches;

Noonan - greater than 60 inches; Heil - greater than 40 inches over glacial till

Depth to high water table: Niobell - 3.5 to 5 feet; Noonan - 3.5 to 5 feet; Heil - plus 1 to 1.5 feet

Flooding: Niobell - none; Noonan - none; Heil - none

Ponding: Niobell - none; Noonan - none; Heil - frequent for long periods

Permeability: Niobell - slow; Noonan - very slow; Heil - very slow

Available water capacity: Niobell - high; Noonan - moderate; Heil - moderate

Organic matter content: Niobell - moderate; Noonan - moderate; Heil - moderate

Surface runoff: Niobell - low; Noonan - low; Heil - negligible

Inclusions**Contrasting inclusions:**

Moderately well drained Miranda soils which have visible salts within a depth of 16 inches on lower footslopes

Well drained Williams soils which do not have a sodium-affected subsoil on backslopes

Similar inclusions:

Soils that have a thicker surface layer than the Heil soil

Use and Management**Cropland**

Main crops: Niobell and Noonan - spring wheat, barley, alfalfa, and sunflowers;

Heil - unsuited

Suitability for cropland: Poorly suited

Management concerns:

Niobell - slow permeability; Noonan - sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability; Heil - ponding, high water table, sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the soil surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.

Deferring tillage when the soils are wet helps to limit compaction.

Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Niobell - IIIs; Noonan - IVs; Heil - VIs

Ecological site: Niobell - Clayey; Noonan - Claypan; Heil - Closed Depression

Conservation tree and shrub group: Niobell - 4; Noonan - 9C; Heil - 10

Forage suitability group: Niobell - Clayey Subsoil; Noonan - Claypan; Heil - Not Suited

NeA—Niobell-Noonan-Max loams, 0 to 3 percent slopes**Composition**

Niobell and similar soils: 35 to 50 percent

Noonan and similar soils: 25 to 35 percent

Max and similar soils: 15 to 25 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Niobell - backslopes; Noonan - footslopes; Max - summits

Slope range: Niobell - 0 to 3 percent; Noonan - 0 to 3 percent; Max - 2 to 3 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile**Niobell****Surface layer:**

0 to 7 inches - dark grayish brown loam

Transitional layer:

7 to 12 inches - grayish brown and light brownish gray loam

Subsoil:

12 to 16 inches - grayish brown clay loam

16 to 28 inches - brown clay loam

28 to 42 inches - light gray, calcareous clay loam with masses of salt and crystals of gypsum

Underlying layer:

42 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Noonan**Surface layer:**

0 to 6 inches - dark grayish brown loam

Subsurface layer:

6 to 8 inches - light brownish gray loam

Subsoil:

8 to 18 inches - grayish brown clay loam

18 to 31 inches - light yellowish brown, calcareous clay loam with masses of salt and nests of gypsum

Underlying layer:

31 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Max**Surface layer:**

0 to 8 inches - dark grayish brown loam

Subsoil:

8 to 14 inches - dark grayish brown loam

14 to 40 inches - light yellowish brown, calcareous loam

Underlying layer:

40 to 52 inches - light yellowish brown, calcareous loam with relict redox features

52 to 80 inches - light yellowish brown, calcareous loam with redox concentrations

Soil Properties and Qualities

Drainage class: Niobell - moderately well drained; Noonan - moderately well drained; Max - well drained

Depth to restrictive feature: Niobell - none; Noonan - natric-top depth ranges from 5 to 10 inches; Max - none

Depth to contrasting parent material: Niobell - greater than 60 inches; Noonan - greater than 60 inches; Max - greater than 60 inches

Depth to high water table: Niobell - 3.5 to 5 feet; Noonan - 3.5 to 5 feet; Max - greater than 6 feet

Flooding: Niobell - none; Noonan - none; Max - none

Ponding: Niobell - none; Noonan - none; Max - none

Permeability: Niobell - slow; Noonan - very slow; Max - moderately slow

Available water capacity: Niobell - high; Noonan - moderate; Max - high

Organic matter content: Niobell - moderate; Noonan - moderate; Max - moderate

Surface runoff: Niobell - low; Noonan - low; Max - low

Inclusions**Contrasting inclusions:**

Moderately well drained Arnegard soils which do not have a sodium-affected subsoil and are dark to a depth greater than 16 inches on footslopes

Moderately well drained Miranda soils which have visible salts within a depth of 16 inches on lower footslopes

Poorly drained Rimlap soils on the outer edges and in the center of basins

Poorly drained Tonka soils in the center of basins

Similar inclusions:

Soils that have more clay in the subsoil than the Max soil

Soils that have less clay in the subsoil than the Niobell and Noonan soils

Use and Management

Cropland

Main crops: Spring wheat, alfalfa, sunflowers, corn, and soybeans

Suitability for cropland: Fairly well suited

Management concerns:

Niobell - slow permeability; Noonan - sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability; Max - few limitations except to conserve moisture

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.

Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Niobell - IIIs; Noonan - IVs; Max - IIc

Ecological site: Niobell - Clayey; Noonan - Claypan; Max - Loamy

Conservation tree and shrub group: Niobell - 4; Noonan - 9C; Max - 3

Forage suitability group: Niobell - Clayey Subsoil; Noonan - Claypan; Max - Loam

Nm—Noonan-Miranda loams, 0 to 2 percent slopes

Composition

Noonan and similar soils: 50 to 60 percent

Miranda and similar soils: 30 to 40 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Noonan - summits and backslopes; Miranda - footslopes

Slope range: Noonan - 0 to 2 percent; Miranda - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Noonan

Surface layer:

0 to 6 inches - dark grayish brown loam

Subsurface layer:

6 to 8 inches - light brownish gray loam

Subsoil:

8 to 18 inches - grayish brown clay loam

18 to 31 inches - light yellowish brown, calcareous clay loam with masses of salts and nests of gypsum

Underlying layer:

31 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Miranda

Surface layer:

0 to 3 inches - gray loam

Subsoil:

3 to 13 inches - dark gray clay loam

13 to 17 inches - grayish brown clay loam with masses of salt and nests of gypsum

17 to 32 inches - light yellowish brown, calcareous clay loam with masses of salt, nests of gypsum, and redox concentrations and depletions

Underlying layer:

32 to 63 inches - light gray, calcareous clay loam with redox concentrations and depletions

63 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Noonan - moderately well drained; Miranda - moderately well drained

Depth to restrictive feature: Noonan - natric-top depth ranges from 5 to 10 inches; Miranda - natric-top depth ranges from 0 to 5 inches

Depth to contrasting parent material: Noonan - greater than 60 inches; Miranda - greater than 60 inches

Depth to high water table: Noonan - 3.5 to 5 feet; Miranda - 3.5 to 5 feet

Flooding: Noonan - none; Miranda - none

Ponding: Noonan - none; Miranda - none

Permeability: Noonan - very slow; Miranda - very slow

Available water capacity: Noonan - moderate; Miranda - moderate

Organic matter content: Noonan - moderate; Miranda - moderately low

Surface runoff: Noonan - low; Miranda - low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Poorly drained Heil soils in basins

Moderately well drained Niobell soils which have less exchangeable sodium in the subsoil than the Noonan soil on footslopes

Well drained Williams soils which do not have a sodium-affected subsoil on backslopes

Use and Management

Cropland or pasture

Main crops: Noonan - spring wheat, barley, and alfalfa; Miranda - unsuited

Suitability for cropland: Generally unsuited

Management concerns:

Sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.

Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Noonan - IVs; Miranda - VIs

Ecological site: Noonan - Claypan; Miranda - Thin Claypan

Conservation tree and shrub group: Noonan - 9C; Miranda - 10

Forage suitability group: Noonan - Claypan; Miranda - Not Suited

Nr—Northville-Farmsworth silt loams, 0 to 2 percent slopes

Composition

Northville and similar soils: 50 to 65 percent

Farmsworth and similar soils: 25 to 35 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Flood plains

Landform position: Northville - microhighs; Farmsworth - microlows

Slope range: Northville - 0 to 2 percent; Farmsworth - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 15 to 75 acres

Typical Profile

Northville

Surface layer:

0 to 5 inches - dark gray silt loam

Transitional layer:

5 to 8 inches - gray silty clay loam

Subsoil:

8 to 22 inches - dark gray silty clay

22 to 42 inches - light brownish gray, calcareous silty clay loam

42 to 58 inches - grayish brown, calcareous silty clay

Underlying layer:

58 to 69 inches - dark gray, calcareous silty clay

69 to 80 inches - light gray, calcareous clay loam with redox concentrations

Farmsworth

Surface layer:

0 to 5 inches - dark gray silt loam

Subsurface layer:

5 to 8 inches - gray silt loam

Subsoil:

8 to 12 inches - dark gray silty clay loam

12 to 19 inches - dark gray silty clay

19 to 25 inches - dark gray silty clay loam with masses of salt and nests of gypsum

25 to 43 inches - gray, calcareous silty clay loam with masses of salt and nests of gypsum

Underlying layer:

- 43 to 52 inches - dark gray, calcareous silty clay loam
- 52 to 80 inches - gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

- Drainage class:** Northville - moderately well drained; Farmsworth - somewhat poorly drained
- Depth to restrictive feature:** Northville - none; Farmsworth - natric-top depth ranges from 5 to 12 inches
- Depth to contrasting parent material:** Northville - greater than 60 inches; Farmsworth - greater than 60 inches
- Depth to high water table:** Northville - 3 to 5 feet; Farmsworth - 1.5 to 3 feet
- Flooding:** Northville - rare for brief periods; Farmsworth - rare for brief periods
- Ponding:** Northville - none; Farmsworth - none
- Permeability:** Northville - slow; Farmsworth - very slow
- Available water capacity:** Northville - moderate; Farmsworth - moderate
- Organic matter content:** Northville - moderate; Farmsworth - moderate
- Surface runoff:** Northville - low; Farmsworth - low

Inclusions**Contrasting inclusions: (May have significant management concerns)**

- Moderately well drained Davis soils which do not have a sodium-affected subsoil on high flood plains
- Poorly drained Durrstein soils which have visible salts within a depth of 15 inches on low flood plains
- Moderately well drained Whitelake and Woonsocket soils which have more sand and less clay in the surface and subsoil on footslopes

Use and Management**Cropland**

- Main crops: Barley, sunflowers, alfalfa, and spring wheat
- Suitability for cropland: Poorly suited

Management concerns:

- Northville - slow permeability; Farmsworth - sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability

Management measures:

- Leaving crop residue on the surface and deferring tillage when the soils are wet help to maintain tilth and limit compaction.
- Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

- Land capability classification:** Northville - IIIs; Farmsworth - IVs
- Ecological site:** Northville - Clayey; Farmsworth - Claypan
- Conservation tree and shrub group:** Northville - 4; Farmsworth - 9W
- Forage suitability group:** Northville - Clayey Subsoil; Farmsworth - Claypan

Nv—Northville-Farmsworth-Hoven silt loams, 0 to 2 percent slopes

Composition

Northville and similar soils: 35 to 45 percent
Farmsworth and similar soils: 25 to 35 percent
Hoven and similar soils: 15 to 25 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Flood plains

Landform position: Northville - microhighs; Farmsworth - microlows;
Hoven - basins

Slope range: Northville - 0 to 2 percent; Farmsworth - 0 to 2 percent; Hoven - 0 to 1 percent

Shape of areas: Irregular

Size of areas: 20 to 200 acres

Typical Profile

Northville

Surface layer:

0 to 5 inches - dark gray silt loam

Transitional layer:

5 to 8 inches - gray silty clay loam

Subsoil:

8 to 22 inches - dark gray silty clay

22 to 42 inches - light brownish gray, calcareous silty clay loam

42 to 58 inches - grayish brown, calcareous silty clay

Underlying layer:

58 to 69 inches - dark gray, calcareous silty clay

69 to 80 inches - light gray, calcareous clay loam with redox concentrations

Farmsworth

Surface layer:

0 to 5 inches - dark gray silt loam

Subsurface layer:

5 to 8 inches - gray silt loam

Subsoil:

8 to 12 inches - dark gray silty clay loam

12 to 19 inches - dark gray silty clay

19 to 25 inches - dark gray silty clay loam with masses of salt and nests of gypsum

25 to 43 inches - gray, calcareous silty clay loam with masses of salt and nests of gypsum

Underlying layer:

43 to 52 inches - dark gray, calcareous silty clay loam

52 to 80 inches - gray, calcareous clay loam with redox concentrations and depletions

Hoven**Surface layer:**

0 to 3 inches - gray silt loam

Subsoil:

3 to 22 inches - gray silty clay

22 to 43 inches - grayish brown, calcareous silty clay loam

43 to 51 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Underlying layer:

51 to 80 inches - gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Northville - moderately well drained; Farmsworth - somewhat poorly drained; Hoven - poorly drained

Depth to restrictive feature: Northville - none; Farmsworth - natric-top depth ranges from 5 to 12 inches; Hoven - natric-top depth ranges from 1 to 6 inches

Depth to contrasting parent material: Northville - greater than 60 inches; Farmsworth - greater than 60 inches; Hoven - greater than 60 inches

Depth to high water table: Northville - 3 to 5 feet; Farmsworth - 1.5 to 3 feet; Hoven - plus 1 to 1.5 feet

Flooding: Northville - rare for brief periods; Farmsworth - rare for brief periods; Hoven - none

Ponding: Northville - none; Farmsworth - none; Hoven - frequent for long periods

Permeability: Northville - slow; Farmsworth - very slow; Hoven - very slow

Available water capacity: Northville - moderate; Farmsworth - moderate; Hoven - moderate

Organic matter content: Northville - moderate; Farmsworth - moderate; Hoven - moderate

Surface runoff: Northville - low; Farmsworth - low; Hoven - negligible

Inclusions**Contrasting inclusions:**

Moderately well drained Davis soils which do not have a sodium-affected subsoil on high flood plains

Poorly drained Durrstein soils which have visible salts within a depth of 15 inches on low flood plains

Similar inclusions:

Soils that have a thicker surface layer than the Hoven soil

Use and Management**Cropland**

Main crops: Northville and Farmsworth - spring wheat, barley, alfalfa, and sunflowers; Hoven - unsuited

Suitability for cropland: Poorly suited

Management concerns:

Northville - slow permeability; Farmsworth - sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability; Hoven - ponding, high water table, sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.

Deferring tillage when the soils are wet helps to limit compaction.

Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Northville - IIIs; Farmsworth - IVs; Hoven - VI

Ecological site: Northville - Clayey; Farmsworth - Claypan; Hoven - Closed Depression

Conservation tree and shrub group: Northville - 4; Farmsworth - 9W; Hoven - 10

Forage suitability group: Northville - Clayey Subsoil; Farmsworth - Claypan; Hoven - Not Suited

Ov—Overshue fine sandy loam, 0 to 1 percent slopes**Composition**

Overshue and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Toeslopes

Slope range: 0 to 1 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile**Surface layer:**

0 to 7 inches - dark gray, fine sandy loam with redox concentrations

Subsoil:

7 to 22 inches - grayish brown fine sandy loam with redox concentrations

22 to 32 inches - light olive brown fine sandy loam with redox concentrations

32 to 42 inches - light yellowish brown sandy loam with redox concentrations and depletions

42 to 57 inches - light gray, calcareous clay loam with redox concentrations and depletions

Underlying layer:

57 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations

Soil Properties and Qualities

Drainage class: Poorly drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 40 inches over glacial till

Depth to high water table: Plus 1 to 1.5 feet

Flooding: None

Ponding: Occasional for long periods

Permeability: Moderately rapid in the loamy sediments and moderately slow in the underlying glacial till

Available water capacity: Moderate

Organic matter content: High

Surface runoff: Low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Carthage soils on backslopes

Somewhat poorly drained Elsmere soils which have more sand in the surface layer and subsoil on toeslopes

Poorly drained Toko soils which have more clay in the subsoil in basins

Use and Management

Cropland

Main crops: Corn, soybeans, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Ponding, high water table, wind erosion, agrochemical leaching

Management measures:

This soil is better suited to late-planted crops.

Minimizing tillage and leaving crop residue on the surface help to control wind erosion.

Timing nitrogen application close to the time crops will use it shortens the time available for leaching. Proper pesticide application is critical.

Interpretive Groups

Land capability classification: IVw

Ecological site: Wet Meadow

Conservation tree and shrub group: 10

Forage suitability group: Wet

Pa—Parnell silty clay loam, 0 to 1 percent slopes

Composition

Parnell and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Basins

Slope range: 0 to 1 percent

Shape of areas: Oval

Size of areas: 5 to 50 acres

Typical Profile

Surface layer:

0 to 7 inches - dark gray silty clay loam

Subsurface layer:

7 to 11 inches - gray, silty clay loam with redox concentrations

Subsoil:

11 to 16 inches - gray silty clay with redox concentrations

16 to 28 inches - dark gray silty clay

28 to 41 inches - gray silty clay with redox depletions

41 to 69 inches - light gray, calcareous silty clay loam with redox concentrations

Underlying layer:

69 to 80 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Very poorly drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: Plus 2 to 0.5 feet

Flooding: None

Ponding: Frequent for very long periods

Permeability: Slow

Available water capacity: High

Organic matter content: High

Surface runoff: Negligible

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Somewhat poorly drained Hamerly soils which are calcareous at or near the surface on footslopes

Poorly drained Heil soils which have a sodium-affected subsoil in basins

Poorly drained Vallers soils which are calcareous at or near the surface on toeslopes

Use and Management**Rangeland**

Main crops: Unsuit

Suitability for cropland: Generally unsuit

Management concerns:

Wetness

Management measures:

Proper grazing management helps to maintain plant vigor.

Restricting grazing during wet periods helps to limit compaction.

Interpretive Groups

Land capability classification: Vw

Ecological site: Shallow Marsh

Conservation tree and shrub group: 10

Forage suitability group: Not Suited

Pc—Parshall loam, 0 to 3 percent slopes**Composition**

Parshall and similar soils: 80 to 90 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Outwash plains

Landform position: Summits and backslopes

Slope range: 0 to 3 percent

Shape of areas: Irregular

Size of areas: 5 to 50 acres

Typical Profile

Surface layer:

0 to 11 inches - very dark grayish brown loam

Subsoil:

11 to 36 inches - dark grayish brown sandy loam

36 to 50 inches - light yellowish brown, calcareous loamy sand

50 to 59 inches - light yellowish brown, calcareous sandy loam with relict redox features

59 to 67 inches - light brownish gray, calcareous sandy loam with relict redox features

Underlying layer:

67 to 80 inches - light yellowish brown, calcareous loamy sand with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Well drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: Greater than 6 feet

Flooding: None

Ponding: None

Permeability: Moderately rapid

Available water capacity: Moderate

Organic matter content: Moderate

Surface runoff: Low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Bowdle soils which have gravelly material at a depth of 20 to 40 inches on footslopes

Well drained Max soils which have more clay and less sand in the surface layer and subsoil and are dark to a depth less than 16 inches on backslopes

Similar inclusions:

Soils that are dark to a depth less than 16 inches

Use and Management

Cropland

Main crops: Spring wheat, barley, alfalfa, corn, sunflowers, and soybeans

Suitability for cropland: Fairly well suited

Management concerns:

Moderate available water capacity, agrochemical leaching

Management measures:

These soils are better suited to early-maturing crops such as small grains.

Minimizing tillage and leaving crop residue on the surface help to conserve moisture.

Timing nitrogen application close to the time crops will use it shortens the time available for leaching. Proper pesticide application is critical.

Interpretive Groups

Land capability classification: IIs

Ecological site: Sandy

Conservation tree and shrub group: 1

Forage suitability group: Loam

PeA—Peever clay loam, 0 to 2 percent slopes

Composition

Peever and similar soils: 80 to 90 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Till plains

Landform position: Summits and backslopes

Slope range: 0 to 2 percent

Shape of areas: Irregular

Size of areas: 5 to 50 acres

Typical Profile

Surface layer:

0 to 7 inches - dark gray clay loam

Subsoil:

7 to 15 inches - dark grayish brown clay loam

15 to 29 inches - light brownish gray, calcareous clay loam

29 to 38 inches - light yellowish brown, calcareous clay loam

Underlying layer:

38 to 56 inches - light yellowish brown, calcareous clay loam with relict redox features

56 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Well drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: 4 to 6 feet

Flooding: None

Ponding: None

Permeability: Slow

Available water capacity: High

Organic matter content: Moderate

Surface runoff: Low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Cavour and Cresbard (Cavour has more exchangeable sodium than the Cresbard soil) soils which have a sodium-affected subsoil on footslopes

Poorly drained Tonka soils in basins

Similar inclusions:

Soils that have less clay in the subsoil

Soils that have shale bedrock within a depth of 60 inches

Use and Management

Cropland

Main crops: Spring wheat, alfalfa, sunflowers, corn, and soybeans

Suitability for cropland: Fairly well suited

Management concerns:

Slow permeability

Management measures:

Minimizing tillage and leaving crop residue on the surface help to conserve moisture and maintain tilth.

Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: IIs

Ecological site: Clayey

Conservation tree and shrub group: 4

Forage suitability group: Clayey Subsoil

PgB—Peever-Buse clay loams, 1 to 4 percent slopes**Composition**

Peever and similar soils: 55 to 65 percent

Buse and similar soils: 25 to 35 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Peever - summits and backslopes; Buse - shoulders

Slope range: Peever - 1 to 4 percent; Buse - 3 to 4 percent

Shape of areas: Irregular

Size of areas: 5 to 50 acres

Typical Profile**Peever****Surface layer:**

0 to 7 inches - dark gray clay loam

Subsoil:

7 to 15 inches - dark grayish brown clay loam

15 to 29 inches - light brownish gray, calcareous clay loam

29 to 38 inches - light yellowish brown, calcareous clay loam

Underlying layer:

38 to 56 inches - light yellowish brown, calcareous clay loam with relict redox features

56 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Buse**Surface layer:**

0 to 7 inches - dark gray, calcareous clay loam

Subsoil:

7 to 21 inches - light brownish gray, calcareous clay loam

21 to 35 inches - light brownish gray, calcareous clay loam with relict redox features

Underlying layer:

35 to 63 inches - light yellowish brown, calcareous clay loam with relict redox features

63 to 80 inches - light brownish gray, calcareous clay loam with relict redox features

Soil Properties and Qualities

Drainage class: Peever - well drained; Buse - well drained

Depth to restrictive feature: Peever - none; Buse - none

Depth to contrasting parent material: Peever - greater than 60 inches;
Buse - greater than 60 inches

Depth to high water table: Peever - 4 to 6 feet; Buse - greater than 6 feet

Flooding: Peever - none; Buse - none

Ponding: Peever - none; Buse - none

Permeability: Peever - slow; Buse - moderately slow

Available water capacity: Peever - high; Buse - high

Organic matter content: Peever - moderate; Buse - moderately low

Surface runoff: Peever - medium; Buse - medium

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Moderately well drained Cresbard soils which have a sodium-affected subsoil on footslopes

Poorly drained Tonka soils in basins

Similar inclusions:

Soils that contain less clay in the subsoil than the Peever soil

Soils that contain more clay in the subsoil than the Buse soil

Soils that have shale bedrock within a depth of 60 inches

Use and Management**Cropland**

Main crops: Spring wheat, alfalfa, sunflowers, corn, and soybeans

Suitability for cropland: Fairly well suited

Management concerns:

Peever - water erosion, slow permeability; Buse - water and wind erosion, high content of lime adversely affects the availability of plant nutrients

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control erosion and conserve moisture.

Chiseling or subsoiling when the soils are dry helps to increase the permeability.

Applying animal wastes, especially on the Buse soil, helps maintain fertility.

Rotations including grasses and legumes help control erosion and maintain fertility, organic matter content, and tilth.

Interpretive Groups

Land capability classification: Peever - IIIe; Buse - IIIe

Ecological site: Peever - Clayey; Buse - Thin Loamy

Conservation tree and shrub group: Peever - 4; Buse - 8K

Forage suitability group: Peever - Clayey Subsoil; Buse - Limy Upland

PoA—Peever-Cavour complex, 0 to 2 percent slopes

Composition

Peever and similar soils: 55 to 65 percent

Cavour and similar soils: 25 to 35 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Peever - summits and backslopes; Cavour - footslopes

Slope range: Peever - 0 to 2 percent; Cavour - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Peever

Surface layer:

0 to 7 inches - dark gray clay loam

Subsoil:

7 to 15 inches - dark grayish brown clay loam

15 to 29 inches - light brownish gray, calcareous clay loam

29 to 38 inches - light yellowish brown, calcareous clay loam

Underlying layer:

38 to 56 inches - light yellowish brown, calcareous clay loam with relict redox features

56 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Cavour

Surface layer:

0 to 5 inches - dark gray loam

Subsurface layer:

5 to 9 inches - light brownish gray silt loam

Subsoil:

9 to 18 inches - gray silty clay

18 to 22 inches - grayish brown clay loam with masses of salt

22 to 45 inches - light brownish gray, calcareous clay loam with masses of salt

Underlying layer:

45 to 65 inches - light gray, calcareous clay loam

65 to 80 inches - pale yellow, calcareous clay loam

Soil Properties and Qualities

Drainage class: Peever - well drained; Cavour - moderately well drained

Depth to restrictive feature: Peever - none; Cavour - natric-top depth ranges from 4 to 18 inches

Depth to contrasting parent material: Peever - greater than 60 inches;
Cavour - greater than 60 inches

Depth to high water table: Peever - 4 to 6 feet; Cavour - 3.5 to 5 feet

Flooding: Peever - none; Cavour - none

Ponding: Peever - none; Cavour - none

Permeability: Peever - slow; Cavour - very slow

Available water capacity: Peever - high; Cavour - moderate

Organic matter content: Peever - moderate; Cavour - moderate

Surface runoff: Peever - low; Cavour - low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Cresbard soils which have less exchangeable sodium in the subsoil than the Cavour soil on footslopes

Moderately well drained Ferney soils which have visible salts within a depth of 16 inches on lower footslopes

Poorly drained Heil soils in basins

Similar inclusions:

Soils that have less clay in the subsoil than the Peever soil

Soils that have shale bedrock within a depth of 60 inches

Use and Management

Cropland

Main crops: Spring wheat, alfalfa, sunflowers, corn, and soybeans

Suitability for cropland: Fairly well suited

Management concerns:

Peever - slow permeability; Cavour - sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.

Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Peever - IIs; Cavour - IVs

Ecological site: Peever - Clayey; Cavour - Claypan

Conservation tree and shrub group: Peever - 4; Cavour - 9C

Forage suitability group: Peever - Clayey Subsoil; Cavour - Claypan

Pp—Pits, gravel and sand

Composition

Orthents and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Outwash plains

Landform position: Excavation and spoil

Slope range: 0 to 60 percent

Shape of areas: Irregular

Size of areas: 5 to 150 acres

Soil Properties and Qualities

Drainage class: Excessively drained

Depth to restrictive feature: Strongly contrasting textural stratification-top depth ranges from 7 to 14 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: Greater than 6 feet

Flooding: None

Ponding: None

Permeability: Very rapid

Available water capacity: Very low

Organic matter content: Low

Surface runoff: Low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Egeland and somewhat excessively drained Renshaw soils which are dark to a depth greater than 7 inches in undisturbed areas

Use and Management

Ecological Site and wildlife habitat

Main crops: Unsited

Suitability for cropland: Unsited

Management concerns:

Water erosion, very low available water capacity; most are gravel pits used mainly as a source of sand and gravel for construction purposes. Some provide limited wildlife habitat.

Abandoned gravel pits can be restored to range, tame pasture, or cropland if reclamation measures are applied.

Management measures:

Shape the area to reduce the slope and use the mounds of overburden material as topsoil dressing.

Apply fertilizer as needed to establish range or pasture plants.

Proper grazing management helps to maintain plant vigor, conserve moisture and control water erosion.

Interpretive Groups

Land capability classification: VIIIs

Ecological site: Not Assigned

Conservation tree and shrub group: 10

Forage suitability group: Not Suited

Pr—Playmoor silty clay loam, 0 to 1 percent slopes

Composition

Playmoor and similar soils: 80 to 90 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Flood plains

Landform position: Low flood plains

Slope range: 0 to 1 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Surface layer:

0 to 9 inches - dark gray, calcareous silty clay loam with masses of salt

Subsoil:

- 9 to 17 inches - gray, calcareous silty clay loam with masses of salt
- 17 to 27 inches - dark gray, calcareous silty clay loam

Underlying layer:

- 27 to 64 inches - light olive gray, calcareous silty clay loam with redox depletions in the upper part and redox concentrations and depletions in the lower part
- 64 to 80 inches - light gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Poorly drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: 0 to 1.5 feet

Flooding: Frequent for brief periods

Ponding: None

Permeability: Moderately slow

Available water capacity: Moderate

Organic matter content: High

Surface runoff: Very low

Inclusions**Contrasting inclusions: (May have significant management concerns)**

- Poorly drained Harriet soils which have a sodium-affected subsoil in microlows on flood plains
- Somewhat poorly drained Lamoure and poorly drained Lowe soils which have less salts in the surface layer on low flood plains

Use and Management**Cropland or pasture**

- Main crops: Barley
- Suitability for cropland: Generally unsuited

Management concerns:

- Flooding, high water table, high salt content in the surface layer

Management measures:

- Plant salt-tolerant crops or grasses.
- Best suited for permanent pasture or hayland species. Defer grazing or haying during wet periods.

Interpretive Groups

Land capability classification: IVw

Ecological site: Saline Subirrigated

Conservation tree and shrub group: 10

Forage suitability group: Saline

Py—Playmoor-Lamoure silty clay loams, channeled**Composition**

- Playmoor and similar soils: 45 to 60 percent
- Lamoure and similar soils: 30 to 45 percent
- Contrasting inclusions: 5 to 15 percent

Setting

Landform: Flood plains

Landform position: Playmoor - low flood plains; Lamoure - low flood plains

Slope range: Playmoor - 0 to 2 percent; Lamoure - 0 to 2 percent

Shape of areas: Long and narrow

Size of areas: 25 to 500 acres

Typical Profile

Playmoor

Surface layer:

0 to 9 inches - dark gray, calcareous silty clay loam with masses of salt

Subsoil:

9 to 17 inches - gray, calcareous silty clay loam with masses of salt

17 to 27 inches - dark gray, calcareous silty clay loam

Underlying layer:

27 to 64 inches - light olive gray, calcareous silty clay loam with redox depletions in the upper part and redox concentrations and depletions in the lower part

64 to 80 inches - light gray, calcareous clay loam with redox concentrations and depletions

Lamoure

Surface layer:

0 to 8 inches - dark gray, calcareous silty clay loam

Subsurface layer:

8 to 38 inches - gray, calcareous silty clay loam with redox concentrations in the lower part

Underlying layer:

38 to 80 inches - light brownish gray, calcareous silt loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Playmoor - poorly drained; Lamoure - poorly drained

Depth to restrictive feature: Playmoor - none; Lamoure - none

Depth to contrasting parent material: Playmoor - greater than 60 inches;
Lamoure - greater than 60 inches

Depth to high water table: Playmoor - 0 to 1.5 feet; Lamoure - 0 to 1.5 feet

Flooding: Playmoor - frequent for brief periods; Lamoure - frequent for brief periods

Ponding: Playmoor - none; Lamoure - none

Permeability: Playmoor - moderately slow; Lamoure - moderately slow

Available water capacity: Playmoor - moderate; Lamoure - high

Organic matter content: Playmoor - high; Lamoure - high

Surface runoff: Playmoor - very low; Lamoure - very low

Other properties: These areas typically are dissected by meandering stream channels.

Inclusions

Contrasting inclusions: (May have significant management concerns)

Poorly drained Harriet soils which have a sodium-affected subsoil in microlows on flood plains

Moderately well drained LaDelle soils which are not calcareous to the surface on high flood plains

Poorly drained Lowe soils on low flood plains

Similar inclusions:

Soils that are dark to a depth less than 24 inches

Use and Management**Rangeland**

Main crops: Unsited

Suitability for cropland: Unsited

Management concerns:

Flooding, high water table, stream channels severely limit use of machinery

Management measures:

Proper grazing management helps to maintain plant vigor and control stream bank erosion.

Restricting grazing during wet periods helps to limit compaction.

Interpretive Groups

Land capability classification: Playmoor - VIw; Lamoure - VIw

Ecological site: Playmoor - Saline Subirrigated; Lamoure - Subirrigated

Conservation tree and shrub group: Playmoor - 10; Lamoure - 10

Forage suitability group: Playmoor - Saline; Lamoure - Wet

Ra—Ranslo silty clay loam, 0 to 1 percent slopes**Composition**

Ranslo and similar soils: 80 to 90 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Flood plains

Landform position: High flood plains

Slope range: 0 to 1 percent

Shape of areas: Long and narrow

Size of areas: 10 to 100 acres

Typical Profile**Surface layer:**

0 to 7 inches - dark gray silty clay loam

Subsurface layer:

7 to 9 inches - gray silt loam

Subsoil:

9 to 25 inches - dark gray silty clay

25 to 37 inches - grayish brown, calcareous silty clay loam

37 to 53 inches - light brownish gray, calcareous silty clay loam

Underlying layer:

53 to 67 inches - grayish brown, calcareous silty clay loam with nests of gypsum and redox depletions

67 to 80 inches - light brownish gray, calcareous clay loam with nests of gypsum and redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Somewhat poorly drained

Depth to restrictive feature: Natric-top depth ranges from 2 to 16 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: 1 to 3 feet

Flooding: Occasional for brief periods

Ponding: None

Permeability: Slow

Available water capacity: Moderate

Organic matter content: High

Surface runoff: Low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Poorly drained Harriet soils which have more exchangeable sodium in the subsoil and have a thinner surface layer in microlows on flood plains

Moderately well drained La Prairie soils which do not have a sodium-affected subsoil on high flood plains

Poorly drained Ludden soils which do not have a sodium-affected subsoil on low flood plains

Use and Management

Cropland or pasture

Main crops: Barley, sunflowers, and spring wheat

Suitability for cropland: Poorly suited

Management concerns:

Flooding, high water table, sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, slow permeability

Management measures:

Leaving crop residue on the surface and deferring tillage when the soil is wet help to maintain tilth and limit compaction.

Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: IVs

Ecological site: Subirrigated

Conservation tree and shrub group: 9W

Forage suitability group: Claypan

Re—Ranslo-Harriet loams, 0 to 2 percent slopes

Composition

Ranslo and similar soils: 45 to 60 percent

Harriet and similar soils: 30 to 45 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Flood plains

Landform position: Ranslo - microhighs; Harriet - microlows

Slope range: Ranslo - 0 to 2 percent; Harriet - 0 to 1 percent

Shape of areas: Long and narrow

Size of areas: 20 to 500 acres

Typical Profile

Ranslo

Surface layer:

0 to 7 inches - dark gray loam

Subsurface layer:

7 to 9 inches - gray silt loam

Subsoil:

9 to 25 inches - dark gray silty clay

25 to 37 inches - grayish brown, calcareous silty clay loam

37 to 53 inches - light brownish gray, calcareous silty clay loam

Underlying layer:

53 to 67 inches - grayish brown, calcareous silty clay loam with nests of gypsum and redox depletions

67 to 80 inches - light brownish gray, calcareous clay loam with nests of gypsum and with redox concentrations and depletions

Harriet

Surface layer:

0 to 2 inches - gray loam

Subsoil:

2 to 8 inches - dark gray silty clay loam

8 to 17 inches - gray, calcareous silty clay loam with masses of salt and nests of gypsum

17 to 34 inches - olive gray and light olive gray, calcareous silty clay loam with masses of salt and nests of gypsum

34 to 42 inches - light gray, calcareous silty clay loam with masses of salt and nests of gypsum

Underlying layer:

42 to 51 inches - light yellowish brown, calcareous sandy loam with redox concentrations

51 to 80 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Ranslo - somewhat poorly drained; Harriet - poorly drained

Depth to restrictive feature: Ranslo - natric-top depth ranges from 2 to 16 inches; Harriet - natric-top depth ranges from 0 to 5 inches

Depth to contrasting parent material: Ranslo - greater than 60 inches; Harriet - greater than 60 inches

Depth to high water table: Ranslo - 1 to 3 feet; Harriet - 0 to 1 foot

Flooding: Ranslo - occasional for brief periods; Harriet - occasional for long periods

Ponding: Ranslo - none; Harriet - none

Permeability: Ranslo - slow; Harriet - very slow

Available water capacity: Ranslo - moderate; Harriet - moderate

Organic matter content: Ranslo - high; Harriet - moderately low

Surface runoff: Ranslo - low; Harriet - very low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained La Prairie soils which do not have a sodium-affected subsoil on high flood plains

Somewhat poorly drained Lamoure soils which do not have a sodium-affected subsoil on low flood plains

Use and Management

Cropland or pasture

Main crops: Ranslo - sunflowers, barley, and spring wheat; Harriet - unsuited
Suitability for cropland: Generally unsuited

Management concerns:

Flooding, high water table, sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, slow permeability

Management measures:

Leaving crop residue on the surface, including grasses and legumes in the cropping system, and deferring tillage when the soils are wet help to maintain tilth and limit compaction.

Chiseling or subsoiling when the soils are dry increases permeability.

Seed cultivated areas to adapted grasses.

Interpretive Groups

Land capability classification: Ranslo - IVs; Harriet - VIs

Ecological site: Ranslo - Subirrigated; Harriet - Saline Lowland

Conservation tree and shrub group: Ranslo - 9W; Harriet - 10

Forage suitability group: Ranslo - Claypan; Harriet - Not Suited

RfA—Renshaw-Fordville loams, 0 to 2 percent slopes

Composition

Renshaw and similar soils: 45 to 60 percent

Fordville and similar soils: 25 to 40 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Outwash plains

Landform position: Renshaw - summits and backslopes; Fordville - footslopes

Slope range: Renshaw - 0 to 2 percent; Fordville - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Renshaw

Surface layer:

0 to 7 inches - dark gray loam

Subsoil:

7 to 15 inches - dark grayish brown loam

15 to 23 inches - light brownish gray, calcareous gravelly loamy sand

Underlying layer:

23 to 47 inches - light brownish gray, calcareous very gravelly loamy sand

47 to 80 inches - pale yellow and light brownish gray, calcareous coarse sand

Fordville

Surface layer:

0 to 8 inches - dark gray loam

Subsoil:

- 8 to 21 inches - dark gray loam
- 21 to 33 inches - pale yellow, calcareous loam

Underlying layer:

- 33 to 64 inches - light brownish gray, calcareous gravelly sand
- 64 to 80 inches - light gray, calcareous sand

Soil Properties and Qualities

Drainage class: Renshaw - somewhat excessively drained; Fordville - well drained

Depth to restrictive feature: Renshaw - strongly contrasting textural stratification-top depth ranges from 14 to 20 inches; Fordville - strongly contrasting textural stratification-top depth ranges from 20 to 40 inches

Depth to contrasting parent material: Renshaw - 14 to 20 inches over gravelly material; Fordville - 20 to 40 inches over gravelly material

Depth to high water table: Renshaw - greater than 6 feet; Fordville - greater than 6 feet

Flooding: Renshaw - none; Fordville - none

Ponding: Renshaw - none; Fordville - none

Permeability: Renshaw - moderate in the loamy sediments and very rapid in the underlying gravelly material; Fordville - moderate in the loamy sediments and very rapid in the underlying gravelly material

Available water capacity: Renshaw - low; Fordville - moderate

Organic matter content: Renshaw - moderate; Fordville - high

Surface runoff: Renshaw - low; Fordville - low

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Well drained Egeland soils which do not have gravelly material within a depth of 40 inches on backslopes

Moderately well drained Embden soils which do not have gravelly material within a depth of 40 inches on footslopes

Similar inclusions:

Soils that have gravelly material within a depth of 14 inches

Use and Management**Cropland**

Main crops: Spring wheat, alfalfa, corn, sunflowers, and soybeans

Suitability for cropland: Fairly well suited

Management concerns:

Renshaw - low available water capacity, agrochemical leaching;

Fordville - moderate available water capacity, agrochemical leaching

Management measures:

These soils are better suited to early-maturing crops such as small grains.

Minimizing tillage and leaving crop residue on the surface help to conserve moisture.

Timing nitrogen application close to the time crops will use it shortens the time available for leaching. Proper pesticide application is critical.

Interpretive Groups

Land capability classification: Renshaw - IVs; Fordville - IIIs

Ecological site: Renshaw - Shallow Gravel; Fordville - Loamy

Conservation tree and shrub group: Renshaw - 6G; Fordville - 6G

Forage suitability group: Renshaw - Very Droughty Loam; Fordville - Droughty Loam

RfB—Renshaw-Fordville loams, 2 to 6 percent slopes

Composition

Renshaw and similar soils: 55 to 65 percent

Fordville and similar soils: 25 to 35 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Outwash plains

Landform position: Renshaw - summits and backslopes; Fordville - footslopes

Slope range: Renshaw - 2 to 6 percent; Fordville - 2 to 6 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Renshaw

Surface layer:

0 to 7 inches - dark gray loam

Subsoil:

7 to 15 inches - dark grayish brown loam

15 to 23 inches - light brownish gray, calcareous gravelly loamy sand

Underlying layer:

23 to 47 inches - light brownish gray, calcareous very gravelly loamy sand

47 to 80 inches - pale yellow and light brownish gray, calcareous coarse sand

Fordville

Surface layer:

0 to 8 inches - dark gray loam

Subsoil:

8 to 21 inches - dark gray loam

21 to 33 inches - pale yellow, calcareous loam

Underlying layer:

33 to 64 inches - light brownish gray, calcareous gravelly sand

64 to 80 inches - light gray, calcareous sand

Soil Properties and Qualities

Drainage class: Renshaw - somewhat excessively drained; Fordville - well drained

Depth to restrictive feature: Renshaw - strongly contrasting textural stratification-top depth ranges from 14 to 20 inches; Fordville - strongly contrasting textural stratification-top depth ranges from 20 to 40 inches

Depth to contrasting parent material: Renshaw - 14 to 20 inches over gravelly material; Fordville - 20 to 40 inches over gravelly material

Depth to high water table: Renshaw - greater than 6 feet; Fordville - greater than 6 feet

Flooding: Renshaw - none; Fordville - none

Ponding: Renshaw - none; Fordville - none

Permeability: Renshaw - moderate in the loamy sediments and very rapid in the underlying gravelly material; Fordville - moderate in the loamy sediments and very rapid in the underlying gravelly material

Available water capacity: Renshaw - low; Fordville - moderate

Organic matter content: Renshaw - moderate; Fordville - high

Surface runoff: Renshaw - medium; Fordville - medium

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Egeland soils which do not have gravelly material within a depth of 40 inches on backslopes

Moderately well drained Embden soils which do not have gravelly material within a depth of 40 inches on footslopes

Similar inclusions:

Soils that have gravelly material within a depth of 14 inches

Use and Management

Cropland

Main crops: Spring wheat, alfalfa, corn, sunflowers, and soybeans

Suitability for cropland: Poorly suited

Management concerns:

Renshaw - water erosion, low available water capacity; Fordville - water erosion, moderate available water capacity

Management measures:

These soils are better suited to early-maturing crops such as small grains.

Minimizing tillage and leaving crop residue on the surface help to conserve moisture and control water erosion.

Timing nitrogen application close to the time crops will use it shortens the time available for leaching. Proper pesticide application is critical.

Interpretive Groups

Land capability classification: Renshaw - IVe; Fordville - IIIe

Ecological site: Renshaw - Shallow Gravel; Fordville - Loamy

Conservation tree and shrub group: Renshaw - 6G; Fordville - 6G

Forage suitability group: Renshaw - Very Droughty Loam; Fordville - Droughty Loam

So—Southam silty clay loam, 0 to 1 percent slopes

Composition

Southam and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Basins

Slope range: 0 to 1 percent

Shape of areas: Oval

Size of areas: 10 to 500 acres

Typical Profile

Surface layer:

0 to 7 inches - very dark gray, calcareous silty clay loam

Subsurface layer:

7 to 51 inches - dark gray, calcareous silty clay loam and silty clay with redox concentrations in the lower part

Underlying layer:

51 to 60 inches - gray, calcareous silty clay with redox concentrations

Soil Properties and Qualities

Drainage class: Very poorly drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: Plus 5 to 1 foot

Flooding: None

Ponding: Frequent for very long periods

Permeability: Slow

Available water capacity: High

Organic matter content: Very high

Surface runoff: Negligible

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Poorly drained Vallers soils which have more sand and less clay on toeslopes

Similar inclusions:

Soils that do not have free carbonates at or near the soil surface

Use and Management**Wildlife habitat**

Main crops: Unsited

Suitability for cropland: Unsited

Management concerns:

Ponding, high water table

Management measures:

Maintain area for wildlife habitat.

Interpretive Groups

Land capability classification: VIIIw

Ecological site: Not Assigned

Conservation tree and shrub group: 10

Forage suitability group: Not Suited

St—Stickney-Dudley silt loams, 0 to 2 percent slopes**Composition**

Stickney and similar soils: 50 to 65 percent

Dudley and similar soils: 25 to 35 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Stickney - summits and backslopes; Dudley - footslopes

Slope range: Stickney - 0 to 2 percent; Dudley - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Stickney

Surface layer:

0 to 7 inches - dark gray silt loam

Subsurface layer:

7 to 10 inches - gray silt loam

Transitional layer:

10 to 13 inches - dark grayish brown and gray silty clay loam

Subsoil:

13 to 22 inches - dark grayish brown clay loam

22 to 40 inches - light brownish gray, calcareous clay loam

Underlying layer:

40 to 80 inches - grayish brown, calcareous clay loam

Dudley

Surface layer:

0 to 5 inches - dark gray silt loam

Subsurface layer:

5 to 7 inches - gray silt loam

Subsoil:

7 to 18 inches - dark gray clay loam

18 to 25 inches - dark grayish brown, calcareous clay loam with masses of salt

25 to 39 inches - grayish brown, calcareous clay loam with masses of salt, nests of gypsum, and redox concentrations

Underlying layer:

39 to 62 inches - grayish brown, calcareous clay loam with redox concentrations and depletions

62 to 80 inches - light gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Stickney - moderately well drained; Dudley - moderately well drained

Depth to restrictive feature: Stickney - none; Dudley - natric-top depth ranges from 7 to 17 inches

Depth to contrasting parent material: Stickney - greater than 60 inches; Dudley - greater than 60 inches

Depth to high water table: Stickney - 3.5 to 5 feet; Dudley - 3.5 to 5 feet

Flooding: Stickney - none; Dudley - none

Ponding: Stickney - none; Dudley - none

Permeability: Stickney - slow; Dudley - very slow

Available water capacity: Stickney - high; Dudley - moderate

Organic matter content: Stickney - moderate; Dudley - moderate

Surface runoff: Stickney - low; Dudley - low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Beadle and Houdek (contain less clay than Beadle) soils which do not have a sodium-affected subsoil on backslopes

Poorly drained Hoven soils in basins

Moderately well drained Jerauld soils which have visible salts within a depth of 16 inches on lower footslopes

Use and Management

Cropland

Main crops: Spring wheat, barley, alfalfa, sunflowers, corn, and soybeans

Suitability for cropland: Poorly suited

Management concerns:

Stickney - slow permeability; Dudley - sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.

Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Stickney - IIIs; Dudley - IVs

Ecological site: Stickney - Clayey; Dudley - Claypan

Conservation tree and shrub group: Stickney - 4; Dudley - 9C

Forage suitability group: Stickney - Clayey Subsoil; Dudley - Claypan

Su—Stickney-Dudley-Hoven silt loams, 0 to 2 percent slopes

Composition

Stickney and similar soils: 35 to 45 percent

Dudley and similar soils: 25 to 35 percent

Hoven and similar soils: 15 to 25 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Stickney - summits and backslopes; Dudley - footslopes; Hoven - basins

Slope range: Stickney - 0 to 2 percent; Dudley - 0 to 2 percent; Hoven - 0 to 1 percent

Shape of areas: Irregular

Size of areas: 50 to 500 acres

Typical Profile

Stickney

Surface layer:

0 to 7 inches - dark gray silt loam

Subsurface layer:

7 to 10 inches - gray silt loam

Transitional layer:

10 to 13 inches - dark grayish brown and gray silty clay loam

Subsoil:

13 to 22 inches - dark grayish brown clay loam

22 to 40 inches - light brownish gray, calcareous clay loam

Underlying layer:

40 to 80 inches - grayish brown, calcareous clay loam

Dudley**Surface layer:**

0 to 5 inches - dark gray silt loam

Subsurface layer:

5 to 7 inches - gray silt loam

Subsoil:

7 to 18 inches - dark gray clay loam

18 to 25 inches - dark grayish brown, calcareous clay loam with masses of salt

25 to 39 inches - grayish brown, calcareous clay loam with masses of salt, nests of gypsum, and redox concentrations

Underlying layer:

39 to 62 inches - grayish brown, calcareous clay loam with redox concentrations and depletions

62 to 80 inches - light gray, calcareous clay loam with redox concentrations and depletions

Hoven**Surface layer:**

0 to 3 inches - gray silt loam

Subsoil:

3 to 22 inches - gray silty clay

22 to 43 inches - grayish brown, calcareous silty clay loam

43 to 51 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Underlying layer:

51 to 80 inches - gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities**Drainage class:** Stickney - moderately well drained; Dudley - moderately well drained; Hoven - poorly drained**Depth to restrictive feature:** Stickney - none; Dudley - natric-top depth ranges from 7 to 17 inches; Hoven - natric-top depth ranges from 1 to 6 inches**Depth to contrasting parent material:** Stickney - greater than 60 inches; Dudley - greater than 60 inches; Hoven - greater than 60 inches**Depth to high water table:** Stickney - 3.5 to 5 feet; Dudley - 3.5 to 5 feet; Hoven - plus 1 to 1.5 feet**Flooding:** Stickney - none; Dudley - none; Hoven - none**Ponding:** Stickney - none; Dudley - none; Hoven - frequent for long periods**Permeability:** Stickney - slow; Dudley - very slow; Hoven - very slow**Available water capacity:** Stickney - high; Dudley - moderate; Hoven - moderate**Organic matter content:** Stickney - moderate; Dudley - moderate; Hoven - moderate**Surface runoff:** Stickney - low; Dudley - low; Hoven - negligible

Inclusions

Contrasting inclusions:

- Well drained Beadle soils which do not have a sodium-affected subsoil on summits
- Moderately well drained Jerauld soils which have visible salts within a depth of 16 inches on lower footslopes

Use and Management

Cropland

- Main crops: Stickney and Dudley - Spring wheat, barley, alfalfa, and sunflowers; Hoven - unsuited
- Suitability for cropland: Poorly suited

Management concerns:

- Stickney - slow permeability; Dudley - sodium-affected subsoil adversely affects crop growth by restricting the penetration of plant roots; Hoven - ponding, high water table, sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots, very slow permeability

Management measures:

- Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.
- Deferring tillage when the Hoven soil is wet helps to limit compaction.
- Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Stickney - IIIs; Dudley - IVs; Hoven - VIs

Ecological site: Stickney - Clayey; Dudley - Claypan; Hoven - Closed Depression

Conservation tree and shrub group: Stickney - 4; Dudley - 9C; Hoven - 10

Forage suitability group: Stickney - Clayey Subsoil; Dudley - Claypan; Hoven - Not Suited

Sw—Straw loam, channeled

Composition

- Straw and similar soils: 75 to 90 percent
- Contrasting inclusions: 10 to 25 percent

Setting

Landform: Flood plains

Landform position: Low flood plains

Slope range: 0 to 2 percent

Shape of areas: Long and narrow

Size of areas: 50 to 500 acres

Typical Profile

Surface layer:

- 0 to 9 inches - dark grayish brown, calcareous loam

Subsurface layer:

- 9 to 25 inches - grayish brown, calcareous loam

Subsoil:

- 25 to 41 inches - light brownish gray, calcareous loam
- 41 to 47 inches - dark gray, calcareous loam

Underlying layer:

47 to 61 inches - grayish brown, calcareous loam

61 to 80 inches - light brownish gray, calcareous loam

Soil Properties and Qualities

Drainage class: Moderately well drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: 3.5 to 5 feet

Flooding: Frequent for brief periods

Ponding: None

Permeability: Moderate

Available water capacity: High

Organic matter content: High

Surface runoff: Low

Other properties: These areas typically are dissected by meandering stream channels.

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Poorly drained Harriet soils which have a sodium-affected subsoil on microlows on flood plains

Somewhat poorly drained Ranslo soils which have a sodium-affected subsoil on high flood plains

Similar inclusions:

Soils that have more silt and less sand

Use and Management**Rangeland**

Main crops: Unsited

Suitability for cropland: Unsited

Management concerns:

Flooding, stream channel severely limits use of machinery

Management measures:

Proper grazing management helps to maintain plant vigor and control stream bank erosion.

Restricting grazing during wet periods helps to limit compaction.

Interpretive Groups

Land capability classification: Vlw

Ecological site: Loamy Overflow

Conservation tree and shrub group: 1

Forage suitability group: Overflow

Sx—Straw loam, 0 to 2 percent slopes**Composition**

Straw and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Flood plains
Landform position: Low flood plains
Slope range: 0 to 2 percent
Shape of areas: Irregular
Size of areas: 10 to 100 acres

Typical Profile

Surface layer:
0 to 9 inches - dark grayish brown, calcareous loam
Subsurface layer:
9 to 25 inches - grayish brown, calcareous loam
Subsoil:
25 to 41 inches - light brownish gray, calcareous loam
41 to 47 inches - dark gray, calcareous loam
Underlying layer:
47 to 61 inches - grayish brown, calcareous loam
61 to 80 inches - light brownish gray, calcareous loam

Soil Properties and Qualities

Drainage class: Moderately well drained
Depth to restrictive feature: None
Depth to contrasting parent material: Greater than 60 inches
Depth to high water table: 3.5 to 5 feet
Flooding: Rare for brief periods
Ponding: None
Permeability: Moderate
Available water capacity: High
Organic matter content: High
Surface runoff: Low

Inclusions

Contrasting inclusions: (May have significant management concerns)
Poorly drained Harriet soils which have a sodium-affected subsoil on microlows on flood plains
Somewhat poorly drained Ranslo soils which have a sodium-affected subsoil on high flood plains
Similar inclusions:
Soils that have more silt and less sand

Use and Management

Cropland
Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers
Suitability for cropland: Well suited
Management concerns:
Few limitations except to conserve moisture
Management measures:
Managing tillage and leaving crop residue conserves moisture and helps to maintain organic matter content and tilth.

Interpretive Groups

Land capability classification: IIc
Ecological site: Loamy

Conservation tree and shrub group: 1

Forage suitability group: Loam

TbE—Talmo-Ethan complex, 9 to 40 percent slopes, very stony

Composition

Talmo and similar soils: 40 to 50 percent

Ethan and similar soils: 30 to 40 percent

Contrasting inclusions: 15 to 25 percent

Setting

Landform: Moraines

Landform position: Talmo - shoulders; Ethan - backslopes

Slope range: Talmo - 9 to 40 percent; Ethan - 9 to 40 percent

Shape of areas: Irregular

Size of areas: 10 to 500 acres

Typical Profile

Talmo

Surface layer:

0 to 7 inches - dark gray, calcareous gravelly loam

Underlying layer:

7 to 58 inches - light yellowish brown, calcareous very gravelly loamy sand

58 to 80 inches - light yellowish brown, calcareous very gravelly sand

Ethan

Surface layer:

0 to 8 inches - grayish brown, calcareous loam

Subsoil:

8 to 20 inches - light yellowish brown, calcareous clay loam

20 to 35 inches - pale yellow, calcareous clay loam

Underlying layer:

35 to 68 inches - light yellowish brown, calcareous clay loam with relict redox features

68 to 80 inches - pale yellow, calcareous clay loam with relict redox features

Soil Properties and Qualities

Drainage class: Talmo - excessively drained; Ethan - well drained

Depth to restrictive feature: Talmo - strongly contrasting textural stratification-top depth ranges from 5 to 14 inches; Ethan - none

Depth to contrasting parent material: Talmo - 5 to 14 inches over very gravelly material; Ethan - greater than 60 inches

Depth to high water table: Talmo - greater than 6 feet; Ethan - greater than 6 feet

Flooding: Talmo - none; Ethan - none

Ponding: Talmo - none; Ethan - none

Permeability: Talmo - very rapid; Ethan - moderately slow

Available water capacity: Talmo - very low; Ethan - high

Organic matter content: Talmo - moderately low; Ethan - moderately low

Surface runoff: Talmo - medium; Ethan - very high

Other properties: Scattered stones and boulders occupy the surface.

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Blendon and moderately well drained Bonilla soils which are dark to a depth greater than 16 inches on footslopes

Somewhat excessively drained Delmont soils which have gravelly material at a depth of 14 to 20 inches on backslopes

Well drained Enet soils which have gravelly material at a depth of 20 to 40 inches on footslopes

Well drained Hand soils which are not calcareous to the surface on backslopes

Similar inclusions:

Soils that have less gravel in the surface layer than the Talmo soil

Soils that have a thinner surface layer than the Ethan soil

Use and Management

Rangeland

Main crops: Unsited

Suitability for cropland: Unsited

Management concerns:

Talmo - numerous stones, water erosion, very low available water capacity;

Ethan - numerous stones, water and wind erosion, high content of lime adversely affects the availability of plant nutrients

Management measures:

Proper grazing management helps to maintain plant vigor and control erosion.

Interpretive Groups

Land capability classification: Talmo - VIIIs; Ethan - VIIIs

Ecological site: Talmo - Very Shallow; Ethan - Thin Upland

Conservation tree and shrub group: Talmo - 10; Ethan - 10

Forage suitability group: Talmo - Not Suited; Ethan - Not Suited

Te—Tetonka silt loam, 0 to 1 percent slopes

Composition

Tetonka and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Basins

Slope range: 0 to 1 percent

Shape of areas: Oval

Size of areas: 5 to 50 acres

Typical Profile

Surface layer:

0 to 8 inches - grayish brown silt loam

Subsurface layer:

8 to 13 inches - light gray silt loam with redox concentrations

Subsoil:

13 to 25 inches - dark gray silty clay

25 to 39 inches - gray silty clay

39 to 47 inches - grayish brown, calcareous clay loam with redox concentrations and depletions

47 to 62 inches - light olive gray, calcareous clay loam with redox concentrations and depletions

Underlying layer:

62 to 80 inches - pale olive, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Poorly drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: Plus 1 to 1 foot

Flooding: None

Ponding: Frequent for long periods

Permeability: Slow

Available water capacity: High

Organic matter content: High

Surface runoff: Negligible

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Somewhat poorly drained Crossplain soils on toeslopes

Moderately well drained Davison soils which are calcareous at or near the surface on footslopes

Very poorly drained Worthing soils in the center of the basins

Use and Management**Cropland**

Main crops: Corn, soybeans, and sunflowers

Suitability for cropland: Poorly suited

Management concerns:

Ponding, high water table

Management measures:

This soil is better suited to late-planted crops.

Maintain existing drainage systems to remove excess water.

Deferring tillage when the soil is wet helps to limit compaction.

Interpretive Groups

Land capability classification: IVw

Ecological site: Wet Meadow

Conservation tree and shrub group: 10

Forage suitability group: Wet

Tk—Toko fine sandy loam, 0 to 1 percent slopes**Composition**

Toko and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains
Landform position: Basins
Slope range: 0 to 1 percent
Shape of areas: Oval
Size of areas: 5 to 30 acres

Typical Profile

Surface layer:
0 to 8 inches - dark gray fine sandy loam
Subsurface layer:
8 to 11 inches - light brownish gray sandy loam with redox concentrations
Subsoil:
11 to 18 inches - gray sandy clay loam with redox concentrations
18 to 28 inches - grayish brown sandy clay loam with redox concentrations
28 to 38 inches - light gray, calcareous sandy loam with redox concentrations
Underlying layer:
38 to 56 inches - light yellowish brown, calcareous loamy sand with redox concentrations and depletions
56 to 80 inches - light gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Poorly drained
Depth to restrictive feature: None
Depth to contrasting parent material: Greater than 20 inches over glacial till
Depth to high water table: Plus 1 to 1.5 feet
Flooding: None
Ponding: Frequent for long periods
Permeability: Moderately slow
Available water capacity: Moderate
Organic matter content: High
Surface runoff: Negligible

Inclusions

Contrasting inclusions: (May have significant management concerns)
Poorly drained Lawet soils which are calcareous at or near the surface on toeslopes

Use and Management

Cropland
Main crops: Corn, soybeans, and sunflowers
Suitability for cropland: Poorly suited
Management concerns:
Ponding, high water table
Management measures:
This soil is better suited to late-planted crops.
Maintain existing drainage systems to remove excess water.
Deferring tillage when the soil is wet helps to limit compaction.

Interpretive Groups

Land capability classification: IVw

Ecological site: Wet Meadow

Conservation tree and shrub group: 10

Forage suitability group: Wet

Tm—Toko fine sandy loam, wet, 0 to 1 percent slopes

Composition

Toko and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Basins

Slope range: 0 to 1 percent

Shape of areas: Oval

Size of areas: 5 to 100 acres

Typical Profile

Surface layer:

0 to 8 inches - dark gray fine sandy loam

Subsurface layer:

8 to 11 inches - light brownish gray sandy loam with redox concentrations

Subsoil:

11 to 18 inches - gray sandy clay loam with redox concentrations

18 to 28 inches - grayish brown sandy clay loam with redox concentrations

28 to 38 inches - light gray, calcareous sandy loam with redox concentrations

Underlying layer:

38 to 56 inches - light yellowish brown, calcareous loamy sand with redox concentrations and depletions

56 to 80 inches - light gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Very poorly drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 20 inches over glacial till

Depth to high water table: Plus 2 to 1 foot

Flooding: None

Ponding: Frequent for very long periods

Permeability: Moderately slow

Available water capacity: Moderate

Organic matter content: High

Surface runoff: Negligible

Inclusions

Contrasting inclusions: (May have significant management concerns)

Poorly drained Lawet soils which are calcareous at or near the surface on toeslopes

Very poorly drained Worthing soils in the center of the basins

Use and Management

Rangeland

Main crops: Unsited

Suitability for cropland: Generally unsited

Management concerns:

Ponding, high water table

Management measures:

Proper grazing management helps to maintain plant vigor.

Restricting grazing during wet periods helps to limit compaction.

Interpretive Groups

Land capability classification: Vw

Ecological site: Shallow Marsh

Conservation tree and shrub group: 10

Forage suitability group: Not Suited

Tn—Tonka silt loam, 0 to 1 percent slopes

Composition

Tonka and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains and lake plains

Landform position: Basins

Slope range: 0 to 1 percent

Shape of areas: Oval

Size of areas: 5 to 30 acres

Typical Profile

Surface layer:

0 to 8 inches - dark gray silt loam

Subsurface layer:

8 to 16 inches - light gray silt loam with redox concentrations

Subsoil:

16 to 35 inches - dark gray silty clay

35 to 41 inches - gray silty clay

Underlying layer:

41 to 68 inches - light gray, calcareous clay loam with redox concentrations and depletions

68 to 80 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Poorly drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: Plus 1 to 1.5 feet

Flooding: None

Ponding: Frequent for long periods

Permeability: Slow

Available water capacity: High

Organic matter content: High

Surface runoff: Negligible

Inclusions

Contrasting inclusions: (May have significant management concerns)

Somewhat poorly drained silty Bearden soils and loamy Hamerly soils which are calcareous at or near the surface on footslopes

Very poorly drained Parnell soils in the center of the basins

Similar inclusions:

Soils that have a thinner surface layer

Use and Management

Cropland

Main crops: Corn, soybeans, and sunflowers

Suitability for cropland: Poorly suited

Management concerns:

Ponding, high water table

Management measures:

This soil is better suited to late-planted crops.

Maintain existing drainage systems to remove excess water.

Deferring tillage when the soil is wet helps to limit compaction.

Interpretive Groups

Land capability classification: IVw

Ecological site: Wet Meadow

Conservation tree and shrub group: 10

Forage suitability group: Wet

To—Tonka-Rimlap silt loams, 0 to 1 percent slopes

Composition

Tonka and similar soils: 55 to 65 percent

Rimlap and similar soils: 25 to 35 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Tonka - basins; Rimlap - basins

Slope range: Tonka - 0 to 1 percent; Rimlap - 0 to 1 percent

Shape of areas: Oval

Size of areas: 5 to 30 acres

Typical Profile

Tonka

Surface layer:

0 to 8 inches - dark gray silt loam

Subsurface layer:

8 to 16 inches - light gray silt loam with redox concentrations

Subsoil:

16 to 35 inches - dark gray silty clay

35 to 41 inches - gray silty clay

Underlying layer:

41 to 68 inches - light gray, calcareous clay loam with redox concentrations and depletions

68 to 80 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

Rimlap**Surface layer:**

0 to 6 inches - dark gray and gray silt loam

Subsurface layer:

6 to 10 inches - light gray silt loam

Subsoil:

10 to 29 inches - dark gray silty clay

29 to 39 inches - dark gray, calcareous silty clay loam with redox concentrations

39 to 45 inches - light brownish gray, calcareous silty clay loam with redox concentrations and depletions

Underlying layer:

45 to 55 inches - light gray, calcareous loam with redox concentrations and depletions

55 to 80 inches - light yellowish brown, calcareous loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Tonka - poorly drained; Rimlap - poorly drained

Depth to restrictive feature: Tonka - none; Rimlap - none

Depth to contrasting parent material: Tonka - greater than 60 inches;
Rimlap - greater than 40 inches over glacial till

Depth to high water table: Tonka - plus 1 to 1 foot; Rimlap - plus 1 to 3 feet

Flooding: Tonka - none; Rimlap - none

Ponding: Tonka - frequent for long periods; Rimlap - frequent for long periods

Permeability: Tonka - slow; Rimlap - very slow

Available water capacity: Tonka - high; Rimlap - high

Organic matter content: Tonka - high; Rimlap - high

Surface runoff: Tonka - negligible; Rimlap - negligible

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Somewhat poorly drained Hamerly soils which are calcareous at or near the surface on footslopes

Poorly drained Heil soils on the edge of the basins

Very poorly drained Parnell soils in the center of the basins

Use and Management**Cropland**

Main crops: Corn, soybeans, and sunflowers

Suitability for cropland: Poorly suited

Management concerns:

Ponding, high water table

Management measures:

These soils are better suited to late-planted crops.

Maintain existing drainage systems to remove excess water.

Deferring tillage when the soils are wet helps to limit compaction.

Interpretive Groups

Land capability classification: Tonka - IVw; Rimlap - IVw

Ecological site: Tonka - Wet Meadow; Rimlap - Wet Meadow

Conservation tree and shrub group: Tonka - 10; Rimlap - 10

Forage suitability group: Tonka - Wet; Rimlap - Wet

Us—Udorthents, silty, 0 to 2 percent slopes

Composition

Udorthents and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains and till plains

Landform position: Summits

Slope range: 0 to 2 percent

Shape of areas: Irregular

Size of areas: 5 to 80 acres

Soil Properties and Qualities

Drainage class: Well drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: Greater than 6 feet

Flooding: None

Ponding: None

Permeability: Moderately slow

Available water capacity: Moderate

Organic matter content: Moderately low

Surface runoff: Low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Great Bend soils which are not calcareous at or near the surface on backslopes

Well drained Putney soils which are not calcareous at or near the surface but have salts at 10 to 20 inches on backslopes

Use and Management

Cropland

Main crops: Spring wheat, alfalfa, corn, and soybeans

Suitability for cropland: Poorly suited

Management concerns:

Wind erosion, high content of lime adversely affects the availability of plant nutrients; these areas are where fill material has been excavated and the topsoil has been replaced

Management measures:

Minimizing tillage and leaving crop residue on the surface help to conserve moisture and control erosion.

Applying animal wastes helps maintain fertility.

Rotations including grasses and legumes help to control erosion and maintain fertility, organic matter content, and tilth.

Interpretive Groups

Land capability classification: IVe

Ecological site: Not Assigned

Conservation tree and shrub group: 10

Forage suitability group: Not Suited

Va—Vallers-Hamerly loams, 0 to 2 percent slopes

Composition

Vallers and similar soils: 55 to 65 percent

Hamerly and similar soils: 25 to 40 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Vallers - toeslopes; Hamerly - footslopes

Slope range: Vallers - 0 to 2 percent; Hamerly - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 5 to 100 acres

Typical Profile

Vallers

Surface layer:

0 to 6 inches - very dark gray, calcareous loam

Transitional layer:

6 to 13 inches - dark gray, calcareous loam

Subsoil:

13 to 22 inches - gray, calcareous loam with redox concentrations

22 to 30 inches - light olive gray, calcareous clay loam with redox concentrations

Underlying layer:

30 to 80 inches - light olive gray, calcareous clay loam with redox concentrations and depletions

Hamerly

Surface layer:

0 to 9 inches - dark gray, calcareous loam

Subsoil:

9 to 14 inches - light gray, calcareous loam

14 to 29 inches - light brownish gray, calcareous loam with redox concentrations

Underlying layer:

29 to 68 inches - light olive gray, calcareous clay loam with redox concentrations and depletions

68 to 80 inches - light gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Vallers - poorly drained; Hamerly - somewhat poorly drained

Depth to restrictive feature: Vallers - none; Hamerly - none

Depth to contrasting parent material: Vallers - greater than 60 inches;
Hamerly - greater than 60 inches

Depth to high water table: Vallers - 0.5 to 1.5 feet; Hamerly - 1.5 to 3.5 feet

Flooding: Vallers - none; Hamerly - none

Ponding: Vallers - none; Hamerly - none

Permeability: Vallers - moderately slow; Hamerly - moderately slow

Available water capacity: Vallers - high; Hamerly - high

Organic matter content: Vallers - high; Hamerly - moderate

Surface runoff: Vallers - very low; Hamerly - low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Very poorly drained Parnell and poorly drained Tonka soils in basins

Similar inclusions:

Soils that have more salts closer to the surface than the Vallers soil

Use and Management

Cropland

Main crops: Corn, barley, spring wheat, sunflowers, and soybeans

Suitability for cropland: Poorly suited

Management concerns:

Vallers - high water table, wind erosion, high content of lime adversely affects the availability of plant nutrients; Hamerly - wind erosion, high content of lime adversely affects the availability of plant nutrients

Management measures:

The soils are better suited to late-planted crops.

Leaving crop residue on the surface and deferring tillage when the soils are wet help to maintain tilth, limit compaction, and control wind erosion.

Rotations including grasses and legumes help to control wind erosion and maintain organic matter content and tilth.

Interpretive Groups

Land capability classification: Vallers - IVw; Hamerly - IIe

Ecological site: Vallers - Subirrigated; Hamerly - Limy Subirrigated

Conservation tree and shrub group: Vallers - 10; Hamerly - 2KK

Forage suitability group: Vallers - Wet; Hamerly - Subirrigated

VgA—Vang loam, 0 to 2 percent slopes

Composition

Vang and similar soils: 80 to 90 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Outwash plains

Landform position: Footslopes

Slope range: 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Surface layer:

0 to 9 inches - very dark gray loam

Subsoil:

- 9 to 17 inches - dark gray clay loam
- 17 to 23 inches - dark grayish brown clay loam
- 23 to 29 inches - grayish brown, calcareous clay loam

Underlying layer:

- 29 to 80 inches - light brownish gray, calcareous very gravelly coarse sand with many shale fragments

Soil Properties and Qualities

Drainage class: Well drained

Depth to restrictive feature: Strongly contrasting textural stratification-top depth ranges from 20 to 40 inches

Depth to contrasting parent material: 20 to 40 inches over shaley gravelly material

Depth to high water table: Greater than 6 feet

Flooding: None

Ponding: None

Permeability: Moderate in the loamy sediments and rapid in the underlying shaley gravelly material

Available water capacity: Moderate

Organic matter content: High

Surface runoff: Low

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Well drained Peever soils which have more clay and less sand in the surface layer and do not have gravelly material within a depth of 40 inches on backslopes

Somewhat excessively drained Renshaw soils which have gravelly material within a depth of 20 inches on backslopes

Similar inclusions:

Soils that have less shale in the gravelly material

Use and Management**Cropland**

Main crops: Spring wheat, alfalfa, corn, sunflowers, and soybeans

Suitability for cropland: Fairly well suited

Management concerns:

Moderate available water capacity, agrochemical leaching

Management measures:

The soil is better suited to early-maturing crops such as small grains.

Minimizing tillage and leaving crop residue on the surface help to conserve moisture.

Timing nitrogen application close to the time crops will use it shortens the time available for leaching. Proper pesticide application is critical.

Interpretive Groups

Land capability classification: IIIs

Ecological site: Loamy

Conservation tree and shrub group: 6G

Forage suitability group: Droughty Loam

W—Water

Open water areas: lakes, ponds, and streams

WaA—Williams-Bowbells loams, 0 to 3 percent slopes

Composition

Williams and similar soils: 45 to 55 percent

Bowbells and similar soils: 35 to 45 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Williams - summits and backslopes; Bowbells - footslopes

Slope range: Williams - 0 to 3 percent; Bowbells - 0 to 3 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Williams

Surface layer:

0 to 7 inches - dark grayish brown loam

Subsoil:

7 to 15 inches - brown clay loam

15 to 22 inches - light olive brown clay loam

22 to 34 inches - light yellowish brown, calcareous clay loam

34 to 47 inches - light yellowish brown, calcareous clay loam with relict redox features

Underlying layer:

47 to 65 inches - light yellowish brown, calcareous clay loam with relict redox features

65 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Bowbells

Surface layer:

0 to 8 inches - dark grayish brown loam

Subsoil:

8 to 18 inches - dark grayish brown clay loam

18 to 28 inches - brown clay loam

28 to 46 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

46 to 56 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

Underlying layer:

56 to 80 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Williams - well drained; Bowbells - moderately well drained

Depth to restrictive feature: Williams - none; Bowbells - none

Depth to contrasting parent material: Williams - greater than 60 inches;
Bowbells - greater than 60 inches

Depth to high water table: Williams - greater than 6 feet; Bowbells - 3.5 to 5 feet

Flooding: Williams - none; Bowbells - none

Ponding: Williams - none; Bowbells - none

Permeability: Williams - moderately slow; Bowbells - moderately slow

Available water capacity: Williams - high; Bowbells - high

Organic matter content: Williams - moderate; Bowbells - high

Surface runoff: Williams - low; Bowbells - low

Other properties: Runoff water flows over the Bowbells soil during periods of rainfall or snowmelt.

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Niobell soils which have a sodium-affected subsoil on footslopes

Poorly drained Tonka soils in basins

Well drained Zahl soils which are calcareous to the surface on shoulders

Similar inclusions:

Soils that have less clay in the subsoil than the Williams soil

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Well suited

Management concerns:

Few limitations except to conserve moisture

Management measures:

Managing tillage and leaving crop residue conserves moisture and helps to maintain tilth and organic matter content.

Interpretive Groups

Land capability classification: Williams - IIc; Bowbells - IIc

Ecological site: Williams - Loamy; Bowbells - Loamy Overflow

Conservation tree and shrub group: Williams - 3; Bowbells - 1

Forage suitability group: Williams - Loam; Bowbells - Overflow

WaB—Williams-Bowbells loams, 1 to 6 percent slopes

Composition

Williams and similar soils: 50 to 65 percent

Bowbells and similar soils: 25 to 40 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Williams - summits and backslopes; Bowbells - footslopes

Slope range: Williams - 3 to 6 percent; Bowbells - 1 to 3 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Williams

Surface layer:

0 to 7 inches - dark grayish brown loam

Subsoil:

7 to 15 inches - brown clay loam

15 to 22 inches - light olive brown clay loam

22 to 34 inches - light yellowish brown, calcareous clay loam

34 to 47 inches - light yellowish brown, calcareous clay loam with relict redox features

Underlying layer:

47 to 65 inches - light yellowish brown, calcareous clay loam with relict redox features

65 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Bowbells

Surface layer:

0 to 8 inches - dark grayish brown loam

Subsoil:

8 to 18 inches - dark grayish brown clay loam

18 to 28 inches - brown clay loam

28 to 46 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

46 to 56 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

Underlying layer:

56 to 80 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Williams - well drained; Bowbells - moderately well drained

Depth to restrictive feature: Williams - none; Bowbells - none

Depth to contrasting parent material: Williams - greater than 60 inches;
Bowbells - greater than 60 inches

Depth to high water table: Williams - greater than 6 feet; Bowbells - 3.5 to 5 feet

Flooding: Williams - none; Bowbells - none

Ponding: Williams - none; Bowbells - none

Permeability: Williams - moderately slow; Bowbells - moderately slow

Available water capacity: Williams - high; Bowbells - high

Organic matter content: Williams - moderate; Bowbells - high

Surface runoff: Williams - medium; Bowbells - low

Other properties: Runoff water flows over the Bowbells soil during periods of rainfall or snowmelt.

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Niobell soils which have a sodium-affected subsoil on footslopes

Poorly drained Tonka soils in basins

Well drained Zahl soils which are calcareous to the surface on shoulders

Similar inclusions:

Soils that have less clay in the subsoil than the Williams soil

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Well suited

Management concerns:

Williams - water erosion; Bowbells - few limitations except to conserve moisture

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control water erosion and conserve moisture.

Contour farming and grassed waterways also help to control water erosion, but slopes in most areas are too short or too irregular for contouring.

Interpretive Groups

Land capability classification: Williams - IIe; Bowbells - IIc

Ecological site: Williams - Loamy; Bowbells - Loamy Overflow

Conservation tree and shrub group: Williams - 3; Bowbells - 1

Forage suitability group: Williams - Loam; Bowbells - Overflow

WbA—Williams-Bowbells-Tonka complex, 0 to 3 percent slopes

Composition

Williams and similar soils: 40 to 50 percent

Bowbells and similar soils: 25 to 35 percent

Tonka and similar soils: 15 to 25 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Williams - summits and backslopes; Bowbells - footslopes;

Tonka - basins

Slope range: Williams - 0 to 3 percent; Bowbells - 0 to 3 percent; Tonka - 0 to 1 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Williams

Surface layer:

0 to 7 inches - dark grayish brown loam

Subsoil:

7 to 15 inches - brown clay loam

15 to 22 inches - light olive brown clay loam

22 to 34 inches - light yellowish brown, calcareous clay loam

34 to 47 inches - light yellowish brown, calcareous clay loam with relict redox features

Underlying layer:

47 to 65 inches - light yellowish brown, calcareous clay loam with relict redox features

65 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Bowbells**Surface layer:**

0 to 8 inches - dark grayish brown loam

Subsoil:

8 to 18 inches - dark grayish brown clay loam

18 to 28 inches - brown clay loam

28 to 46 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

46 to 56 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

Underlying layer:

56 to 80 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

Tonka**Surface layer:**

0 to 8 inches - dark gray silt loam

Subsurface layer:

8 to 16 inches - light gray silt loam with redox concentrations

Subsoil:

16 to 35 inches - dark gray silty clay

35 to 41 inches - gray silty clay

Underlying layer:

41 to 68 inches - light gray, calcareous clay loam with redox concentrations and depletions

68 to 80 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Williams - well drained; Bowbells - moderately well drained; Tonka - poorly drained

Depth to restrictive feature: Williams - none; Bowbells - none; Tonka - none

Depth to contrasting parent material: Williams - greater than 60 inches;

Bowbells - greater than 60 inches; Tonka - greater than 60 inches

Depth to high water table: Williams - greater than 6 feet; Bowbells - 3.5 to 5 feet; Tonka - plus 1 to 1 foot

Flooding: Williams - none; Bowbells - none; Tonka - none

Ponding: Williams - none; Bowbells - none; Tonka - frequent for long periods

Permeability: Williams - moderately slow; Bowbells - moderately slow; Tonka - slow

Available water capacity: Williams - high; Bowbells - high; Tonka - high

Organic matter content: Williams - moderate; Bowbells - high; Tonka - high

Surface runoff: Williams - low; Bowbells - low; Tonka - negligible

Other properties: Runoff water flows over the Bowbells soil during periods of rainfall or snowmelt.

Inclusions

Contrasting inclusions:

Moderately well drained Niobell soils which have a sodium-affected subsoil on footslopes

Well drained Zahl soils which are calcareous to the surface on shoulders

Similar inclusions:

Soils that have less clay in the subsoil than the Williams soil

Use and Management

Cropland

Main crops: Williams and Bowbells - corn, soybeans, spring wheat, alfalfa, and sunflowers; Tonka - corn, soybeans, spring wheat, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Williams and Bowbells - few limitations except to conserve moisture;

Tonka - ponding, high water table

Management measures:

Minimizing tillage and leaving crop residue on the surface help to conserve moisture.

The Tonka soil is better suited to late-planted crops. Deferring tillage when the soils are wet helps to limit compaction. Maintain existing drainage systems to remove excess water on the Tonka soil.

Interpretive Groups

Land capability classification: Williams - IIc; Bowbells - IIc; Tonka - IVw

Ecological site: Williams - Loamy; Bowbells - Loamy Overflow; Tonka - Wet Meadow

Conservation tree and shrub group: Williams - 3; Bowbells - 1; Tonka - 10

Forage suitability group: Williams - Loam; Bowbells - Overflow; Tonka - Wet

WbB—Williams-Bowbells-Tonka complex, 0 to 6 percent slopes

Composition

Williams and similar soils: 40 to 50 percent

Bowbells and similar soils: 25 to 35 percent

Tonka and similar soils: 15 to 25 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Williams - summits and backslopes; Bowbells - footslopes; Tonka - basins

Slope range: Williams - 3 to 6 percent; Bowbells - 1 to 3 percent; Tonka - 0 to 1 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Williams

Surface layer:

0 to 7 inches - dark grayish brown loam

Subsoil:

7 to 15 inches - brown clay loam

15 to 22 inches - light olive brown clay loam

22 to 34 inches - light yellowish brown, calcareous clay loam

34 to 47 inches - light yellowish brown, calcareous clay loam with relict redox features

Underlying layer:

47 to 65 inches - light yellowish brown, calcareous clay loam with relict redox features

65 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Bowbells

Surface layer:

0 to 8 inches - dark grayish brown loam

Subsoil:

8 to 18 inches - dark grayish brown clay loam

18 to 28 inches - brown clay loam

28 to 46 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

46 to 56 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

Underlying layer:

56 to 80 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

Tonka

Surface layer:

0 to 8 inches - dark gray silt loam

Subsurface layer:

8 to 16 inches - light gray silt loam with redox concentrations

Subsoil:

16 to 35 inches - dark gray silty clay

35 to 41 inches - gray silty clay

Underlying layer:

41 to 68 inches - light gray, calcareous clay loam with redox concentrations and depletions

68 to 80 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Williams - well drained; Bowbells - moderately well drained; Tonka - poorly drained

Depth to restrictive feature: Williams - none; Bowbells - none; Tonka - none

Depth to contrasting parent material: Williams - greater than 60 inches; Bowbells - greater than 60 inches; Tonka - greater than 60 inches

Depth to high water table: Williams - greater than 6 feet; Bowbells - 3.5 to 5 feet;
Tonka - plus 1 to 1 foot

Flooding: Williams - none; Bowbells - none; Tonka - none

Ponding: Williams - none; Bowbells - none; Tonka - frequent for long periods

Permeability: Williams - moderately slow; Bowbells - moderately slow; Tonka - slow

Available water capacity: Williams - high; Bowbells - high; Tonka - high

Organic matter content: Williams - moderate; Bowbells - high; Tonka - high

Surface runoff: Williams - medium; Bowbells - low; Tonka - negligible

Other properties: Runoff water flows over the Bowbells soil during periods of rainfall or snowmelt.

Inclusions

Contrasting inclusions:

Moderately well drained Niobell soils which have a sodium-affected subsoil on footslopes

Well drained Zahl soils which are calcareous to the surface on shoulders

Similar inclusions:

Soils that have less clay in the subsoil than the Williams soil

Use and Management

Cropland

Main crops: Williams and Bowbells - corn, soybeans, spring wheat, alfalfa, and sunflowers; Tonka - corn, soybeans, spring wheat, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Williams - water erosion; Bowbells - few limitations except to conserve moisture;
Tonka - ponding, high water table

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control water erosion and conserve moisture.

Contour farming and grassed waterways also help to control water erosion, but slopes in most areas are too short or too irregular for contouring.

The Tonka soil is better suited to late-planted crops. Deferring tillage when the soils are wet helps to limit compaction. Maintain existing drainage systems to remove excess water on the Tonka soil.

Interpretive Groups

Land capability classification: Williams - IIe; Bowbells - IIc; Tonka - IVw

Ecological site: Williams - Loamy; Bowbells - Loamy Overflow; Tonka - Wet Meadow

Conservation tree and shrub group: Williams - 3; Bowbells - 1; Tonka - 10

Forage suitability group: Williams - Loam; Bowbells - Overflow; Tonka - Wet

WcA—Williams-Niobell loams, 0 to 3 percent slopes

Composition

Williams and similar soils: 50 to 60 percent

Niobell and similar soils: 25 to 35 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Till plains

Landform position: Williams - summits and backslopes; Niobell - footslopes

Slope range: Williams - 0 to 3 percent; Niobell - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile

Williams

Surface layer:

0 to 7 inches - dark grayish brown loam

Subsoil:

7 to 15 inches - brown clay loam

15 to 22 inches - light olive brown clay loam

22 to 34 inches - light yellowish brown, calcareous clay loam

34 to 47 inches - light yellowish brown, calcareous clay loam with relict redox features

Underlying layer:

47 to 65 inches - light yellowish brown, calcareous clay loam with relict redox features

65 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Niobell

Surface layer:

0 to 7 inches - dark grayish brown loam

Transitional layer:

7 to 12 inches - grayish brown and light brownish gray loam

Subsoil:

12 to 16 inches - grayish brown clay loam

16 to 28 inches - brown clay loam

28 to 42 inches - light gray, calcareous clay loam with masses of salt and crystals of gypsum

Underlying layer:

42 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Williams - well drained; Niobell - moderately well drained

Depth to restrictive feature: Williams - none; Niobell - none

Depth to contrasting parent material: Williams - greater than 60 inches;
Niobell - greater than 60 inches

Depth to high water table: Williams - greater than 6 feet; Niobell - 3.5 to 5 feet

Flooding: Williams - none; Niobell - none

Ponding: Williams - none; Niobell - none

Permeability: Williams - moderately slow; Niobell - slow

Available water capacity: Williams - high; Niobell - high

Organic matter content: Williams - moderate; Niobell - moderate

Surface runoff: Williams - low; Niobell - low

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Bowbells soils which do not have a sodium-affected subsoil and are dark to a depth greater than 16 inches on footslopes
 Moderately well drained Noonan soils which have more exchangeable sodium in the subsoil than the Niobell soil on lower footslopes
 Poorly drained Tonka soils in basins

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers
 Suitability for cropland: Fairly well suited

Management concerns:

Williams - few limitations except to conserve moisture; Niobell - slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.
 Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Williams - IIc; Niobell - IIIs

Ecological site: Williams - Loamy; Niobell - Clayey

Conservation tree and shrub group: Williams - 3; Niobell - 4

Forage suitability group: Williams - Loam; Niobell - Clayey Subsoil

WcB—Williams-Niobell loams, 3 to 6 percent slopes

Composition

Williams and similar soils: 55 to 65 percent
 Niobell and similar soils: 25 to 35 percent
 Contrasting inclusions: 10 to 20 percent

Setting

Landform: Till plains

Landform position: Williams - summits and backslopes; Niobell - footslopes

Slope range: Williams - 3 to 6 percent; Niobell - 3 to 6 percent

Shape of areas: Irregular

Size of areas: 10 to 50 acres

Typical Profile

Williams

Surface layer:

0 to 7 inches - dark grayish brown loam

Subsoil:

7 to 15 inches - brown clay loam

15 to 22 inches - light olive brown clay loam

22 to 34 inches - light yellowish brown, calcareous clay loam

34 to 47 inches - light yellowish brown, calcareous clay loam with relict redox features

Underlying layer:

47 to 65 inches - light yellowish brown, calcareous clay loam with relict redox features

65 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Niobell

Surface layer:

0 to 7 inches - dark grayish brown loam

Transitional layer:

7 to 12 inches - grayish brown and light brownish gray loam

Subsoil:

12 to 16 inches - grayish brown clay loam

16 to 28 inches - brown clay loam

28 to 42 inches - light gray, calcareous clay loam with crystals of gypsum and masses of salt

Underlying layer:

42 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Williams - well drained; Niobell - moderately well drained

Depth to restrictive feature: Williams - none; Niobell - none

Depth to contrasting parent material: Williams - greater than 60 inches; Niobell - greater than 60 inches

Depth to high water table: Williams - greater than 6 feet; Niobell - 3.5 to 5 feet

Flooding: Williams - none; Niobell - none

Ponding: Williams - none; Niobell - none

Permeability: Williams - moderately slow; Niobell - slow

Available water capacity: Williams - high; Niobell - high

Organic matter content: Williams - moderate; Niobell - moderate

Surface runoff: Williams - medium; Niobell - medium

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Bowbells soils which do not have a sodium-affected subsoil and are dark to a depth greater than 16 inches on footslopes

Moderately well drained Noonan soils which have more exchangeable sodium in the subsoil than the Niobell soils on lower footslopes

Poorly drained Tonka soils in basins

Well drained Zahl soils which are calcareous to the surface on shoulders

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Williams - water erosion; Niobell - water erosion

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to control water erosion, conserve moisture, and maintain organic matter content and tilth.
Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Williams - IIe; Niobell - IIIe

Ecological site: Williams - Loamy; Niobell - Clayey

Conservation tree and shrub group: Williams - 3; Niobell - 4

Forage suitability group: Williams - Loam; Niobell - Clayey Subsoil

WdA—Williams-Niobell-Tonka complex, 0 to 3 percent slopes**Composition**

Williams and similar soils: 40 to 50 percent

Niobell and similar soils: 25 to 35 percent

Tonka and similar soils: 15 to 25 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Williams - summits and backslopes; Niobell - footslopes;
Tonka - basins

Slope range: Williams - 0 to 3 percent; Niobell - 0 to 2 percent; Tonka - 0 to 1 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile**Williams****Surface layer:**

0 to 7 inches - dark grayish brown loam

Subsoil:

7 to 15 inches - brown clay loam

15 to 22 inches - light olive brown clay loam

22 to 34 inches - light yellowish brown, calcareous clay loam

34 to 47 inches - light yellowish brown, calcareous clay loam with relict redox features

Underlying layer:

47 to 65 inches - light yellowish brown, calcareous clay loam with relict redox features

65 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Niobell**Surface layer:**

0 to 7 inches - dark grayish brown loam

Transitional layer:

7 to 12 inches - grayish brown and light brownish gray loam

Subsoil:

12 to 16 inches - grayish brown clay loam

16 to 28 inches - brown clay loam

28 to 42 inches - light gray, calcareous clay loam with masses of salt and crystals of gypsum

Underlying layer:

42 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Tonka**Surface layer:**

0 to 8 inches - dark gray silt loam

Subsurface layer:

8 to 16 inches - light gray, silt loam with redox concentrations

Subsoil:

16 to 35 inches - dark gray silty clay

35 to 41 inches - gray silty clay

Underlying layer:

41 to 68 inches - light gray, calcareous clay loam with redox concentrations and depletions

68 to 80 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Williams - well drained; Niobell - moderately well drained;

Tonka - poorly drained

Depth to restrictive feature: Williams - none; Niobell - none; Tonka - none

Depth to contrasting parent material: Williams - greater than 60 inches;

Niobell - greater than 60 inches; Tonka - greater than 60 inches

Depth to high water table: Williams - greater than 6 feet; Niobell - 3.5 to 5 feet;

Tonka - plus 1 to 1 foot

Flooding: Williams - none; Niobell - none; Tonka - none

Ponding: Williams - none; Niobell - none; Tonka - frequent for long periods

Permeability: Williams - moderately slow; Niobell - slow; Tonka - slow

Available water capacity: Williams - high; Niobell - high; Tonka - high

Organic matter content: Williams - moderate; Niobell - moderate; Tonka - high

Surface runoff: Williams - low; Niobell - low; Tonka - negligible

Inclusions**Contrasting inclusions:**

Moderately well drained Bowbells soils which do not have a sodium-affected subsoil and are dark to a depth greater than the 16 inches on footslopes

Moderately well drained Noonan soils which have more exchangeable sodium in the subsoil than the Niobell soil on lower footslopes

Similar inclusions:

Soils that have a thinner surface layer than the Tonka soil

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Williams - few limitations except to conserve moisture; Niobell - slow permeability; Tonka - ponding, high water table, slow permeability

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to conserve moisture and maintain organic matter content and tilth.

The Tonka soil is better suited to late-planted crops. Deferring tillage when the soils are wet helps to limit compaction. Maintain existing drainage systems to remove excess water on the Tonka soil.

Chiseling or subsoiling when the soils are dry increases permeability.

Interpretive Groups

Land capability classification: Williams - IIc; Niobell - IIIs; Tonka - IVw

Ecological site: Williams - Loamy; Niobell - Clayey; Tonka - Wet Meadow

Conservation tree and shrub group: Williams - 3; Niobell - 4; Tonka - 10

Forage suitability group: Williams - Loam; Niobell - Clayey Subsoil; Tonka - Wet

WhD—Williams-Vida loams, 6 to 15 percent slopes

Composition

Williams and similar soils: 45 to 55 percent

Vida and similar soils: 35 to 45 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Moraines

Landform position: Williams - backslopes; Vida - shoulders

Slope range: Williams - 6 to 9 percent; Vida - 9 to 15 percent

Shape of areas: Irregular

Size of areas: 5 to 100 acres

Typical Profile

Williams

Surface layer:

0 to 7 inches - dark grayish brown loam

Subsoil:

7 to 15 inches - brown clay loam

15 to 22 inches - light olive brown clay loam

22 to 34 inches - light yellowish brown, calcareous clay loam

34 to 47 inches - light yellowish brown, calcareous clay loam with relict redox features

Underlying layer:

47 to 65 inches - light yellowish brown, calcareous clay loam with relict redox features

65 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Vida**Surface layer:**

0 to 3 inches - dark grayish brown loam

Subsoil:

3 to 9 inches - brown clay loam

9 to 21 inches - light yellowish brown, calcareous clay loam

Underlying layer:

21 to 45 inches - pale yellow, calcareous clay loam with relict redox features

45 to 80 inches - light yellowish brown, calcareous clay loam with relict redox features

Soil Properties and Qualities

Drainage class: Williams - well drained; Vida - well drained

Depth to restrictive feature: Williams - none; Vida - none

Depth to contrasting parent material: Williams - greater than 60 inches;
Vida - greater than 60 inches

Depth to high water table: Williams - greater than 6 feet; Vida - greater than 6 feet

Flooding: Williams - none; Vida - none

Ponding: Williams - none; Vida - none

Permeability: Williams - moderately slow; Vida - moderately slow

Available water capacity: Williams - high; Vida - high

Organic matter content: Williams - moderate; Vida - moderately low

Surface runoff: Williams - medium; Vida - high

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Moderately well drained Bowbells soils that are dark to a depth greater than 16 inches on footslopes

Somewhat excessively drained Lehr soils which have gravelly material within a depth of 20 inches on backslopes

Well drained Zahl soils which are calcareous to the surface on shoulders

Similar inclusions:

Soils that have less clay in the subsoil than the Williams soil

Use and Management**Cropland**

Main crops: Spring wheat, alfalfa, corn, soybeans, and sunflowers

Suitability for cropland: Poorly suited

Management concerns:

Water erosion

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control water erosion and conserve moisture.

Contour farming, terraces, and grassed waterways also help to control water erosion, but slopes in some areas are too short or too irregular for contouring or terracing.

Interpretive Groups

Land capability classification: Williams - IIIe; Vida - IVe

Ecological site: Williams - Loamy; Vida - Loamy

Conservation tree and shrub group: Williams - 3; Vida - 3

Forage suitability group: Williams - Loam; Vida - Loam

WmB—Williams-Zahl-Bowbells loams, 1 to 6 percent slopes

Composition

Williams and similar soils: 40 to 55 percent
Zahl and similar soils: 25 to 35 percent
Bowbells and similar soils: 15 to 25 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Williams - summits and backslopes; Zahl - shoulders;
Bowbells - footslopes

Slope range: Williams - 3 to 6 percent; Zahl - 3 to 6 percent; Bowbells - 1 to 3 percent

Shape of areas: Irregular

Size of areas: 10 to 300 acres

Typical Profile

Williams

Surface layer:

0 to 7 inches - dark grayish brown loam

Subsoil:

7 to 15 inches - brown clay loam

15 to 22 inches - light olive brown clay loam

22 to 34 inches - light yellowish brown, calcareous clay loam

34 to 47 inches - light yellowish brown, calcareous clay loam with relict redox features

Underlying layer:

47 to 65 inches - light yellowish brown, calcareous clay loam with relict redox features

65 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Zahl

Surface layer:

0 to 8 inches - dark grayish brown, calcareous loam

Subsoil:

8 to 19 inches - pale yellow, calcareous loam

19 to 29 inches - pale yellow, calcareous clay loam

Underlying layer:

29 to 80 inches - pale yellow, calcareous clay loam with relict redox features

Bowbells

Surface layer:

0 to 8 inches - dark grayish brown loam

Subsoil:

8 to 18 inches - dark grayish brown clay loam

18 to 28 inches - brown clay loam

28 to 46 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

46 to 56 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

Underlying layer:

56 to 80 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Williams - well drained; Zahl - well drained; Bowbells - moderately well drained

Depth to restrictive feature: Williams - none; Zahl - none; Bowbells - none

Depth to contrasting parent material: Williams - greater than 60 inches;

Zahl - greater than 60 inches; Bowbells - greater than 60 inches

Depth to high water table: Williams - greater than 6 feet; Zahl - greater than 6 feet; Bowbells - 3.5 to 5 feet

Flooding: Williams - none; Zahl - none; Bowbells - none

Ponding: Williams - none; Zahl - none; Bowbells - none

Permeability: Williams - moderately slow; Zahl - moderately slow; Bowbells - moderately slow

Available water capacity: Williams - high; Zahl - high; Bowbells - high

Organic matter content: Williams - moderate; Zahl - moderately low; Bowbells - high

Surface runoff: Williams - medium; Zahl - medium; Bowbells - low

Other properties: Runoff water flows over the Bowbells soil during periods of rainfall or snowmelt.

Inclusions

Contrasting inclusions:

Moderately well drained Niobell soils which have a sodium-affected subsoil on footslopes

Poorly drained Tonka soils in basins

Similar inclusions:

Soils that have less clay in the subsoil than the Williams soil

Use and Management

Cropland

Main crops: Corn, soybeans, spring wheat, alfalfa, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Williams - water erosion; Zahl - water and wind erosion, high content of lime adversely affects the availability of plant nutrients; Bowbells - few limitations except to conserve moisture

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control erosion and conserve moisture.

Contour farming and grassed waterways help to control water erosion, but slopes in most areas are too short or too irregular for contouring and terracing.

Applying animal wastes, especially on the Zahl soil, helps maintain fertility.

Rotations including grasses and legumes help to control erosion and maintain fertility, organic matter content, and tilth.

Interpretive Groups

Land capability classification: Williams - IIe; Zahl - IIIe; Bowbells - IIc

Ecological site: Williams - Loamy; Zahl - Thin Loamy; Bowbells - Loamy Overflow

Conservation tree and shrub group: Williams - 3; Zahl - 8K; Bowbells - 1

Forage suitability group: Williams - Loam; Zahl - Limy Upland; Bowbells - Overflow

WmC—Williams-Zahl-Bowbells loams, 2 to 9 percent slopes

Composition

Williams and similar soils: 40 to 50 percent

Zahl and similar soils: 25 to 40 percent

Bowbells and similar soils: 15 to 25 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Williams - backslopes; Zahl - shoulders; Bowbells - footslopes

Slope range: Williams - 6 to 9 percent; Zahl - 6 to 9 percent; Bowbells - 2 to 6 percent

Shape of areas: Irregular

Size of areas: 10 to 300 acres

Typical Profile

Williams

Surface layer:

0 to 7 inches - dark grayish brown loam

Subsoil:

7 to 15 inches - brown clay loam

15 to 22 inches - light olive brown clay loam

22 to 34 inches - light yellowish brown, calcareous clay loam

34 to 47 inches - light yellowish brown, calcareous clay loam with relict redox features

Underlying layer:

47 to 65 inches - light yellowish brown, calcareous clay loam with relict redox features

65 to 80 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

Zahl

Surface layer:

0 to 8 inches - dark grayish brown, calcareous loam

Subsoil:

8 to 19 inches - pale yellow, calcareous loam

19 to 29 inches - pale yellow, calcareous clay loam

Underlying layer:

29 to 80 inches - pale yellow, calcareous clay loam with relict redox features

Bowbells**Surface layer:**

0 to 8 inches - dark grayish brown loam

Subsoil:

8 to 18 inches - dark grayish brown clay loam

18 to 28 inches - brown clay loam

28 to 46 inches - light yellowish brown, calcareous clay loam with redox concentrations and depletions

46 to 56 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

Underlying layer:

56 to 80 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Williams - well drained; Zahl - well drained; Bowbells - well drained

Depth to restrictive feature: Williams - none; Zahl - none; Bowbells - none

Depth to contrasting parent material: Williams - greater than 60 inches;

Zahl - greater than 60 inches; Bowbells - greater than 60 inches

Depth to high water table: Williams - greater than 6 feet; Zahl - greater than 6 feet; Bowbells - 4 to 6 feet

Flooding: Williams - none; Zahl - none; Bowbells - none

Ponding: Williams - none; Zahl - none; Bowbells - none

Permeability: Williams - moderately slow; Zahl - moderately slow; Bowbells - moderately slow

Available water capacity: Williams - high; Zahl - high; Bowbells - high

Organic matter content: Williams - moderate; Zahl - moderately low; Bowbells - high

Surface runoff: Williams - medium; Zahl - medium; Bowbells - medium

Other properties: Runoff water flows over the Bowbells soil during periods of rainfall or snowmelt.

Inclusions**Contrasting inclusions:**

Poorly drained Tonka soils in basins

Similar inclusions:

Soils that have less clay in the subsoil than the Williams soil

Soils that have a thinner surface layer than the Zahl soil

Use and Management**Cropland**

Main crops: Spring wheat, alfalfa, corn, soybeans, and sunflowers

Suitability for cropland: Fairly well suited

Management concerns:

Williams - water erosion; Zahl - water and wind erosion, high content of lime adversely affects the availability of plant nutrients; Bowbells - water erosion

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control erosion and conserve moisture.

Contour farming, terraces, and grassed waterways help to control water erosion, but slopes in most areas are too short or too irregular for contouring and terracing.

Applying animal wastes, especially on the Zahl soil, helps maintain fertility.

Rotations including grasses and legumes help to control erosion, and maintain fertility, organic matter content, and tilth.

Interpretive Groups

Land capability classification: Williams - IIe; Zahl - IVe; Bowbells - IIe

Ecological site: Williams - Loamy; Zahl - Thin Loamy; Bowbells - Loamy

Conservation tree and shrub group: Williams - 3; Zahl - 8K; Bowbells - 1

Forage suitability group: Williams - Loam; Zahl - Limy Upland; Bowbells - Loam

Wn—Winship-Tonka silt loams, 0 to 1 percent slopes

Composition

Winship and similar soils: 55 to 65 percent

Tonka and similar soils: 25 to 40 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Winship - toeslopes; Tonka - basins

Slope range: Winship - 0 to 1 percent; Tonka - 0 to 1 percent

Shape of areas: Long and narrow

Size of areas: 10 to 60 acres

Typical Profile

Winship

Surface layer:

0 to 25 inches - dark gray silt loam

Transitional layer:

25 to 34 inches - gray silt loam

Subsoil:

34 to 44 inches - dark gray silty clay loam

44 to 57 inches - dark grayish brown silty clay loam

57 to 72 inches - light brownish gray, calcareous silty clay loam with redox concentrations

Underlying layer:

72 to 80 inches - pale yellow, calcareous, varved silt loam with redox concentrations and depletions

Tonka

Surface layer:

0 to 8 inches - dark gray silt loam

Subsurface layer:

8 to 16 inches - light gray silt loam with redox concentrations

Subsoil:

16 to 35 inches - dark gray silty clay

35 to 41 inches - gray silty clay

Underlying layer:

41 to 68 inches - light gray, calcareous clay loam with redox concentrations and depletions

68 to 80 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Winship - somewhat poorly drained; Tonka - poorly drained

Depth to restrictive feature: Winship - none; Tonka - none

Depth to contrasting parent material: Winship - greater than 60 inches;
Tonka - greater than 60 inches

Depth to high water table: Winship - 1.5 to 3.5 feet; Tonka - plus 1 to 1.5 feet

Flooding: Winship - none; Tonka - none

Ponding: Winship - none; Tonka - frequent for long periods

Permeability: Winship - moderately slow; Tonka - slow

Available water capacity: Winship - high; Tonka - high

Organic matter content: Winship - high; Tonka - high

Surface runoff: Winship - low; Tonka - negligible

Other properties: Runoff water flows over the Winship soil during periods of rainfall or snowmelt.

Inclusions

Contrasting inclusions: (May have significant management concerns)

Somewhat poorly drained Bearden soils which are calcareous at or near the surface on footslopes

Moderately well drained Beotia soils which are dark to a depth less than 30 inches and have less clay on footslopes

Moderately well drained Harmony soils which are dark to a depth less than 30 inches on footslopes

Use and Management

Cropland

Main crops: Corn, soybeans, sunflowers, and spring wheat

Suitability for cropland: Fairly well suited

Management concerns:

Winship - wetness; Tonka - ponding, high water table

Management measures:

These soils are better suited to late-planted crops.

Deferring tillage when the soils are wet helps to limit compaction.

Interpretive Groups

Land capability classification: Winship - IIw; Tonka - IVw

Ecological site: Winship - Loamy Overflow; Tonka - Wet Meadow

Conservation tree and shrub group: Winship - 2; Tonka - 10

Forage suitability group: Winship - Subirrigated; Tonka - Wet

Wo—Winship-Tonka silt loams, till substratum, 0 to 1 percent slopes

Composition

Winship and similar soils: 55 to 65 percent

Tonka and similar soils: 25 to 35 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Winship - toeslopes; Tonka - basins

Slope range: Winship - 0 to 1 percent; Tonka - 0 to 1 percent

Shape of areas: Irregular

Size of areas: 10 to 60 acres

Typical Profile

Winship

Surface layer:

0 to 18 inches - dark gray silt loam

Transitional layer:

18 to 27 inches - grayish brown silt loam

Subsoil:

27 to 35 inches - dark gray silty clay loam

35 to 41 inches - grayish brown silty clay loam

41 to 47 inches - pale yellow, calcareous silt loam with redox concentrations

Underlying layer:

47 to 57 inches - pale yellow, calcareous, varved silt loam with redox concentrations

57 to 80 inches - light brownish gray, calcareous clay loam with redox concentrations and depletions

Tonka

Surface layer:

0 to 8 inches - dark gray silt loam

Subsurface layer:

8 to 16 inches - light gray silt loam with redox concentrations

Subsoil:

16 to 35 inches - dark gray silty clay

35 to 41 inches - gray silty clay

Underlying layer:

41 to 68 inches - light gray, calcareous clay loam with redox concentrations and depletions

68 to 80 inches - pale yellow, calcareous clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Winship - somewhat poorly drained; Tonka - poorly drained

Depth to restrictive feature: Winship - none; Tonka - none

Depth to contrasting parent material: Winship - greater than 40 inches over glacial till; Tonka - greater than 60 inches

Depth to high water table: Winship - 1.5 to 3.5 feet; Tonka - plus 1 to 1.5 feet

Flooding: Winship - none; Tonka - none

Ponding: Winship - none; Tonka - frequent for long periods

Permeability: Winship - moderately slow; Tonka - slow

Available water capacity: Winship - high; Tonka - high

Organic matter content: Winship - high; Tonka - high

Surface runoff: Winship - low; Tonka - negligible

Other properties: Runoff water flows over the Winship soil during periods of rainfall or snowmelt.

Inclusions

Contrasting inclusions: (May have significant management concerns)

Somewhat poorly drained Bearden soils which are calcareous at or near the surface on footslopes

Moderately well drained Beotia soils which are dark to a depth less than 30 inches and have less clay on footslopes

Moderately well drained Harmony soils which are dark to a depth less than 30 inches on footslopes

Similar inclusions:

Soils that are greater than 60 inches to loamy glacial till

Use and Management

Cropland

Main crops: Corn, soybeans, sunflowers, and spring wheat

Suitability for cropland: Fairly well suited

Management concerns:

Winship - wetness; Tonka - ponding, high water table

Management measures:

These soils are better suited to late-planted crops.

Deferring tillage when the soils are wet helps to limit compaction.

Interpretive Groups

Land capability classification: Winship - IIw; Tonka - IVw

Ecological site: Winship - Loamy Overflow; Tonka - Wet Meadow

Conservation tree and shrub group: Winship - 2; Tonka - 10

Forage suitability group: Winship - Subirrigated; Tonka - Wet

Ws—Woonsocket-Whitelake fine sandy loams, 0 to 2 percent slopes

Composition

Woonsocket and similar soils: 45 to 60 percent

Whitelake and similar soils: 30 to 40 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Outwash plains

Landform position: Woonsocket - summits and backslopes; Whitelake - footslopes

Slope range: Woonsocket - 0 to 2 percent; Whitelake - 0 to 2 percent

Shape of areas: Irregular

Size of areas: 10 to 200 acres

Typical Profile

Woonsocket

Surface layer:

0 to 7 inches - dark gray fine sandy loam

Transitional layer:

7 to 9 inches - dark grayish brown and grayish brown fine sandy loam

Subsoil:

9 to 15 inches - dark grayish brown sandy clay loam

15 to 25 inches - grayish brown sandy clay loam

25 to 37 inches - light brownish gray, calcareous fine sandy loam with redox concentrations and depletions

Underlying layer:

37 to 80 inches - pale yellow, calcareous fine sandy loam with redox concentrations and depletions

Whitelake**Surface layer:**

0 to 8 inches - dark gray fine sandy loam

Subsurface layer:

8 to 12 inches - light brownish gray loamy fine sand

Subsoil:

12 to 21 inches - grayish brown sandy clay loam

21 to 35 inches - light olive brown, calcareous sandy loam with redox concentrations

Underlying layer:

35 to 64 inches - light olive brown, calcareous sandy loam

64 to 80 inches - light yellowish brown, calcareous sandy loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Woonsocket - moderately well drained; Whitelake - moderately well drained

Depth to restrictive feature: Woonsocket - none; Whitelake - natric-top depth ranges from 9 to 20 inches

Depth to contrasting parent material: Woonsocket - greater than 60 inches; Whitelake - greater than 60 inches

Depth to high water table: Woonsocket - 3 to 5 feet; Whitelake - 3 to 5 feet

Flooding: Woonsocket - none; Whitelake - none

Ponding: Woonsocket - none; Whitelake - none

Permeability: Woonsocket - moderately slow in the solum and moderately rapid or rapid in the underlying material; Whitelake - slow in the solum and moderate or moderately rapid in the underlying material

Available water capacity: Woonsocket - moderate; Whitelake - moderate

Organic matter content: Woonsocket - moderate; Whitelake - moderate

Surface runoff: Woonsocket - low; Whitelake - low

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Well drained Blendon soils which do not have a sodium-affected subsoil and are dark to a depth greater than 20 inches on footslopes

Moderately well drained Northville soils which have more clay and less sand in the surface and subsoil than the Woonsocket soils on microhighs on flood plains

Well drained Henkin soils which do not have a sodium-affected subsoil on footslopes

Use and Management**Cropland**

Main crops: Spring wheat, alfalfa, corn, soybeans, and sunflowers

Suitability for cropland: Poorly suited

Management concerns:

Woonsocket - wind erosion, moderate available water capacity; Whitelake - wind erosion, moderate available water capacity, slow permeability in the subsoil, sodium-affected subsoil adversely affects plant growth by restricting the penetration of plant roots

Management measures:

Minimizing tillage, leaving crop residue on the surface, and including grasses and legumes in the cropping system help to control wind erosion, conserve moisture, and maintain organic matter content and tilth.
Wind stripcropping and field windbreaks also help to control wind erosion.
Chiseling or subsoiling when the soils are dry helps to increase water infiltration rate.

Interpretive Groups

Land capability classification: Woonsocket - IIIe; Whitelake - IVe

Ecological site: Woonsocket - Sandy; Whitelake - Claypan

Conservation tree and shrub group: Woonsocket - 5; Whitelake - 9L

Forage suitability group: Woonsocket - Droughty Loam; Whitelake - Claypan

Wt—Worthing silty clay loam, 0 to 1 percent slopes**Composition**

Worthing and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Basins

Slope range: 0 to 1 percent

Shape of areas: Oval

Size of areas: 5 to 50 acres

Typical Profile**Surface layer:**

0 to 10 inches - dark gray silty clay loam

Subsoil:

10 to 45 inches - dark gray silty clay

45 to 60 inches - light olive gray, calcareous silty clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Very poorly drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: Plus 2 to 1 foot

Flooding: None

Ponding: Frequent for very long periods

Permeability: Slow

Available water capacity: High

Organic matter content: High

Surface runoff: Negligible

Inclusions**Contrasting inclusions: (May have significant management concerns)**

Moderately well drained Davison soils which are calcareous at or near the surface on footslopes

Poorly drained Hoven soils which have a sodium-affected subsoil on the edge of the basins

Poorly drained Tetonka soils on the edge of the basins

Similar inclusions:

Soils that are ponded for longer periods of time

Use and Management

Rangeland

Main crops: Unsuit

Suitability for cropland: Generally unsuit

Management concerns:

Wetness

Management measures:

Proper grazing management helps to maintain plant vigor.

Restricting grazing during wet periods helps to limit compaction.

Interpretive Groups

Land capability classification: Vw

Ecological site: Shallow Marsh

Conservation tree and shrub group: 10

Forage suitability group: Not Suited

Ww—Worthing silty clay loam, ponded

Composition

Worthing and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Basins

Slope range: 0 to 1 percent

Shape of areas: Oval

Size of areas: 10 to 200 acres

Typical Profile

Surface layer:

0 to 10 inches - dark gray silty clay loam

Subsoil:

10 to 45 inches - dark gray silty clay

45 to 60 inches - light olive gray, calcareous silty clay loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Very poorly drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: Plus 3 to 0.5 feet

Flooding: None

Ponding: Frequent for very long periods

Permeability: Slow

Available water capacity: High

Organic matter content: High

Surface runoff: Negligible

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Davison soils which are calcareous at or near the surface on footslopes

Poorly drained Tetonka soils which are ponded for shorter periods of time on slightly higher positions

Use and Management

Wildlife habitat

Main crops: Unsuitied

Suitability for cropland: Unsuitied

Management concerns:

Wetness

Management measures:

Maintain area for wildlife habitat.

Interpretive Groups

Land capability classification: VIIIw

Ecological site: Not Assigned

Conservation tree and shrub group: 10

Forage suitability group: Not Suited

ZaE—Zahill loam, 15 to 40 percent slopes

Composition

Zahill and similar soils: 80 to 90 percent

Contrasting inclusions: 10 to 20 percent

Setting

Landform: Moraines

Landform position: Shoulders

Slope range: 15 to 40 percent

Shape of areas: Irregular

Size of areas: 10 to 50 acres

Typical Profile

Surface layer:

0 to 3 inches - dark grayish brown, calcareous loam

Subsoil:

3 to 18 inches - pale yellow, calcareous loam

Underlying layer:

18 to 30 inches - pale yellow, calcareous loam with relict redox features

30 to 80 inches - light yellowish brown, calcareous loam with relict redox features

Soil Properties and Qualities

Drainage class: Well drained

Depth to restrictive feature: None

Depth to contrasting parent material: Greater than 60 inches

Depth to high water table: Greater than 6 feet

Flooding: None

Ponding: None

Permeability: Moderately slow

Available water capacity: High

Organic matter content: Low

Surface runoff: Very high

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Arnegard soils which are dark to a depth greater than 16 inches on footslopes

Somewhat excessively drained Lehr soils which have gravelly material within a depth of 20 inches on backslopes

Well drained Max soils which are dark to a depth greater than 7 inches on backslopes

Use and Management

Rangeland

Main crops: Unsuit

Suitability for cropland: Unsuit

Management concerns:

Water and wind erosion, high content of lime adversely affects the availability of plant nutrients

Management measures:

Proper grazing management helps to maintain plant vigor and control erosion.

Interpretive Groups

Land capability classification: VIIe

Ecological site: Thin Loamy

Conservation tree and shrub group: 10

Forage suitability group: Not Suited

ZbC—Zahl-Max loams, 6 to 9 percent slopes

Composition

Zahl and similar soils: 50 to 60 percent

Max and similar soils: 30 to 45 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Till plains

Landform position: Zahl - shoulders; Max - backslopes

Slope range: Zahl - 6 to 9 percent; Max - 6 to 9 percent

Shape of areas: Irregular

Size of areas: 5 to 50 acres

Typical Profile

Zahl

Surface layer:

0 to 8 inches - dark grayish brown, calcareous loam

Subsoil:

8 to 19 inches - pale yellow, calcareous loam

19 to 29 inches - pale yellow, calcareous clay loam

Underlying layer:

29 to 80 inches - pale yellow, calcareous clay loam with relict redox features

Max

Surface layer:

0 to 8 inches - dark grayish brown loam

Subsoil:

8 to 14 inches - dark grayish brown loam

14 to 40 inches - light yellowish brown, calcareous loam

Underlying layer:

40 to 52 inches - light yellowish brown, calcareous loam with relict redox features

52 to 80 inches - light yellowish brown, calcareous loam with redox concentrations

Soil Properties and Qualities

Drainage class: Zahl - well drained; Max - well drained

Depth to restrictive feature: Zahl - none; Max - none

Depth to contrasting parent material: Zahl - greater than 60 inches; Max - greater than 60 inches

Depth to high water table: Zahl - greater than 6 feet; Max - greater than 6 feet

Flooding: Zahl - none; Max - none

Ponding: Zahl - none; Max - none

Permeability: Zahl - moderately slow; Max - moderately slow

Available water capacity: Zahl - high; Max - high

Organic matter content: Zahl - moderately low; Max - moderate

Surface runoff: Zahl - medium; Max - medium

Inclusions

Contrasting inclusions: (May have significant management concerns)

The moderately well drained Arnegard soils which are dark to a depth greater than 16 inches on footslopes

Similar inclusions:

Soils that have a thinner surface layer than the Zahl soil

Use and Management

Cropland or pasture

Main crops: Spring wheat, alfalfa, corn, sunflowers, and soybeans

Suitability for cropland: Fairly well suited

Management concerns:

Zahl - water and wind erosion, high content of lime adversely affects the availability of plant nutrients; Max - water erosion

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control erosion and conserve moisture.

Contour farming, terraces, and grassed waterways also help to control water erosion, but slopes in some areas are too short or too irregular for contouring and terracing.

Applying animal wastes, especially on the Zahl soil, helps maintain fertility.

Rotations including grasses and legumes help to control erosion and maintain fertility, organic matter content, and tilth.

Interpretive Groups

Land capability classification: Zahl - IVe; Max - IIIe

Ecological site: Zahl - Thin Loamy; Max - Loamy

Conservation tree and shrub group: Zahl - 8K; Max - 3

Forage suitability group: Zahl - Limy Upland; Max - Loam

ZbD—Zahl-Max loams, 9 to 20 percent slopes**Composition**

Zahl and similar soils: 45 to 60 percent

Max and similar soils: 25 to 40 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Moraines

Landform position: Zahl - shoulders; Max - backslopes

Slope range: Zahl - 15 to 20 percent; Max - 9 to 15 percent

Shape of areas: Irregular

Size of areas: 10 to 100 acres

Typical Profile**Zahl****Surface layer:**

0 to 8 inches - dark grayish brown, calcareous loam

Subsoil:

8 to 19 inches - pale yellow, calcareous loam

19 to 29 inches - pale yellow, calcareous clay loam

Underlying layer:

29 to 80 inches - pale yellow, calcareous clay loam with relict redox features

Max**Surface layer:**

0 to 8 inches - dark grayish brown loam

Subsoil:

8 to 14 inches - dark grayish brown loam

14 to 40 inches - light yellowish brown, calcareous loam

Underlying layer:

40 to 52 inches - light yellowish brown, calcareous loam with relict redox features

52 to 80 inches - light yellowish brown, calcareous loam with redox concentrations

Soil Properties and Qualities

Drainage class: Zahl - well drained; Max - well drained

Depth to restrictive feature: Zahl - none; Max - none

Depth to contrasting parent material: Zahl - greater than 60 inches; Max - greater than 60 inches

Depth to high water table: Zahl - greater than 6 feet; Max - greater than 6 feet

Flooding: Zahl - none; Max - none

Ponding: Zahl - none; Max - none

Permeability: Zahl - moderately slow; Max - moderately slow

Available water capacity: Zahl - high; Max - high

Organic matter content: Zahl - moderately low; Max - moderate

Surface runoff: Zahl - high; Max - high

Inclusions

Contrasting inclusions: (May have significant management concerns)

Moderately well drained Arnegard soils which are dark to a depth greater than 16 inches on footslopes

Somewhat excessively drained Lehr soils which have gravelly material within a depth of 20 inches on backslopes

Similar inclusions:

Soils that have a thinner surface layer than the Zahl soil

Use and Management

Rangeland

Main crops: Zahl - unsuited; Max - spring wheat and alfalfa

Suitability for cropland: Generally unsuited

Management concerns:

Zahl - water and wind erosion, high content of lime adversely affects the availability of plant nutrients; Max - water erosion

Management measures:

Proper grazing management helps to maintain plant vigor and control erosion.

Seed cultivated areas to adapted grasses.

Interpretive Groups

Land capability classification: Zahl - VIIe; Max - IVe

Ecological site: Zahl - Thin Loamy; Max - Loamy

Conservation tree and shrub group: Zahl - 10; Max - 3

Forage suitability group: Zahl - Limy Upland; Max - Loam

ZgD—Zell-Great Bend silt loams, 6 to 25 percent slopes

Composition

Zell and similar soils: 50 to 60 percent

Great Bend and similar soils: 30 to 40 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landform: Lake plains

Landform position: Zell - shoulders; Great Bend - backslopes

Slope range: Zell - 9 to 25 percent; Great Bend - 6 to 9 percent

Shape of areas: Irregular

Size of areas: 10 to 50 acres

Typical Profile

Zell

Surface layer:

0 to 7 inches - dark grayish brown, calcareous silt loam

Subsoil:

7 to 31 inches - pale yellow, calcareous silt loam

Underlying layer:

31 to 49 inches - pale yellow, calcareous, varved silt loam

49 to 80 inches - pale yellow, calcareous, varved silt loam with relict redox features

Great Bend

Surface layer:

0 to 7 inches - dark gray silt loam

Subsoil:

7 to 12 inches - grayish brown silt loam

12 to 32 inches - pale yellow, calcareous silt loam

Underlying layer:

32 to 53 inches - pale yellow, silt loam

53 to 80 inches - pale yellow, calcareous, varved silt loam with redox concentrations and depletions

Soil Properties and Qualities

Drainage class: Zell - well drained; Great Bend - well drained

Depth to restrictive feature: Zell - none; Great Bend - none

Depth to contrasting parent material: Zell - greater than 60 inches;
Great Bend - greater than 60 inches

Depth to high water table: Zell - greater than 6 feet; Great Bend - greater than 6 feet

Flooding: Zell - none; Great Bend - none

Ponding: Zell - none; Great Bend - none

Permeability: Zell - moderate in the solum and moderate to slow in the underlying material; Great Bend - moderate in the solum and moderate to slow in the underlying material

Available water capacity: Zell - high; Great Bend - high

Organic matter content: Zell - moderately low; Great Bend - moderate

Surface runoff: Zell - high; Great Bend - medium

Inclusions

Contrasting inclusions: (May have significant management concerns)

Well drained Beotia soils which are dark to a depth greater than 16 inches on footslopes

Well drained Huffton soils which contain nests of salt and gypsum near the surface on shoulders

Similar inclusions:

Soils that have more very fine sand and less silt than the Great Bend soils

Soils that have gypsum and other salts closer to the surface than the Great Bend soils

Use and Management

Cropland or pasture

Main crops: Zell - unsuited; Great Bend - spring wheat, alfalfa, corn, soybeans, and sunflowers

Suitability for cropland: Poorly suited

Management concerns:

Zell - water and wind erosion, high content of lime adversely affects the availability of plant nutrients; Great Bend - water erosion

Management measures:

Minimizing tillage and leaving crop residue on the surface help to control erosion and conserve moisture.

Contour farming, terraces, and grassed waterways also help to control water erosion, but slopes in most areas are too short or too irregular for contouring and terracing.

Rotations including grasses and legumes help to control erosion and maintain fertility, organic matter content, and tilth.

Seed cultivated areas to adapted grasses.

Interpretive Groups

Land capability classification: Zell - VIe; Great Bend - IIIe

Ecological site: Zell - Thin Loamy; Great Bend - Loamy

Conservation tree and shrub group: Zell - 10; Great Bend - 3

Forage suitability group: Zell - Limy Upland; Great Bend - Loam

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the county. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as rangeland and woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

The soils in the county are assigned to various interpretive groups at the end of each map unit description and in some of the tables. The groups for each map unit are also shown in the "Interpretive Groups" table.

Soil Quality

Definition of Soil Quality

Soil quality is the ability of a soil to function within its surroundings, support plant and animal productivity, and maintain or enhance water and air quality. This is also referred to as soil health.

Functions of Soil

Soil is a living, dynamic resource. It has biological, chemical, and physical properties which are continually changing. Soil provides a physical, chemical, and biological environment for the exchange of water, air, and nutrients necessary for living organisms.

Soil controls the movement of rainfall or irrigation water on the land. Some of the water runs off the soil and directly enters surface water drainage systems. The remaining water either evaporates or infiltrates the soil. There it is stored and used for plant growth or percolates through the soil into the ground water. This control of water flow affects the movement of soluble materials, such as nitrate nitrogen and pesticides, through the environment.

Soil regulates biological activity and chemical exchanges. This affects nutrient cycling, plant growth, and decomposition of organic materials. Soil also acts as a filter to protect the quality of water and air. It provides mechanical support and a rooting environment for living organisms.

Soil quality can be viewed in two ways: In the first view, some soils are better suited than others to perform specific functions. For example, soils that are shallow to bedrock are poorly suited for supporting deep-rooted crops or trees. Soils high in sand and gravel content may have an inherently poor quality for filtering septic system wastes. Alternatively, these same soils may have a high quality or suitability for road and street construction. This view of soil quality is useful when comparing soils and is often used to evaluate the suitability of soils for specific uses.

The second view of soil quality relates to the dynamic nature of soils. Even though a soil may have a certain ability or level of quality for a specific activity, it may be functioning at a level below its inherent capability. This may be due to past disturbance or current management systems. For example, a farming system that does not protect the surface layer from erosion may result in soil erosion and loss of organic matter, nutrients, and other beneficial properties. In most cases, the eroded soil functions at less than its original potential for crop production. Its condition or health is considered impaired or lower in quality. In another example, a soil in a wetland, if drained or covered with sediment from nearby uplands, may not serve as effectively as a filter as it would in its natural condition.

Importance of Soil Quality to Landowners

Soil quality has a direct affect on plant growth and productivity for crop, range, hay, and woodland production. It affects how water moves into and through the soil. Maintaining or enhancing soil quality can help reduce the negative effects of soil erosion. Increasing soil quality can reduce the movement of nitrates and other chemicals to adjacent water bodies and ground water. Maintaining a high level of soil quality will ensure the soil resource is sustained for the future.

Many soils have undergone a degradation of their inherent quality through past agricultural operations. However, improved management practices, such as conservation tillage, implementing nutrient and moisture management systems, and establishment of riparian buffers or windbreaks can improve soil quality. As a rule, management practices that maintain a vegetative cover on the soil, return the maximum practical amount of residue, and minimize soil disturbance (tillage), will result in higher levels of soil quality.

Degradation of soil quality can have negative effects on the soil resource and costly offsite impacts. Soil erosion and the consequential deposition of sediment by wind or water are examples. Other negative effects of soil degradation include: compaction and loss of granular structure of surface soil layers, reduction of infiltration rates and organic matter levels, and formation of surface crusts. Degradation of soils can also lead to nutrient loss or imbalances, pesticide carryover, and reduced biological activity.

Soil Quality Indicators

The quality of most soils can be improved over time if managed properly. Key indicators of soil quality can be observed and monitored periodically to ensure the quality of the soil is maintained or enhanced.

Soil quality indicators are soil properties or processes that can be monitored to establish changes in the soil. Indicators can be categorized into four general groups: visual (sensory), physical, chemical, and biological.

Visual indicators may be obtained from observation or photographic interpretation. Exposure of subsoils, change in soil color, ephemeral gullies, ponding, plant response, and surface crusting are a few examples. Visual evidence can be a clear indication that soil quality is changing in either a negative or a positive way. The senses of feel and smell can also be used to evaluate certain soil properties.

Physical indicators are usually obtained by observation or field and laboratory analyses. They include topsoil thickness, bulk density, porosity, aggregate stability, texture, crusting, and compaction. These indicators reflect factors affecting root growth, soil biological activity, seedling emergence, and infiltration or movement of water and air within the soil.

Chemical indicators usually require sampling and field or laboratory analyses. They include measurements of pH, salinity, organic matter, phosphorus concentrations, cation-exchange capacity, and nutrients. The chemical condition of soil affects soil-plant relationships, water quality, buffering capacities, and mobility of nutrients and contaminants.

Biological indicators may be obtained by observation or measurement. They include measurements of micro- and macro-organisms and their activities. Respiration rates to detect microbial decomposition of organic matter and populations of bacteria, fungi, earthworms, nematodes, and mites can be used as biological indicators of soil quality.

Soil quality can be monitored through observation and/or measurement of key soil quality indicators. Soil quality score cards and a test kit (USDA-Soil Quality Institute, 1998) are available to assist in the assessment process. The monitoring program should include several indicators and take into consideration the time of year that sites are monitored, stage of crop growth, and location within the field where observations are made.

Monitoring soil quality should primarily be used to detect trends that are measurable over a 1- to 10-year period. Monitoring trends determines whether the soil is improving, degrading, or remaining steady under the current management system. This allows land managers to detect problems before undesired and possibly irreversible loss of soil quality occurs.

The local office of the Natural Resources Conservation Service, Soil Conservation District, or Cooperative Extension Service can help establish a plan for monitoring soil quality.

Crops

General management needed for crops and pasture is suggested in this section. The estimated yields of the main crops and pasture plants are listed for each soil and the system of land capability classification used by the Natural Resources Conservation Service is explained.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading "Detailed Soil Map Units." Specific information can be obtained from the local office

of the Natural Resources Conservation Service, the South Dakota Cooperative Extension Service, and the Agricultural Experiment Station at South Dakota State University.

The potential of the soils in Spink County for increased crop production is good. Crop production could be increased by extending the latest crop production technology to all cropland in the county. The soil survey can greatly facilitate the application of such technology. The soil resource is agriculture's foundation. Protecting the soil resource requires an understanding of soil quality.

About 71 percent of the acreage in Spink County is used for cultivated crops (USDC, 1997). The major crops are corn, soybeans, spring wheat, and sunflowers. Oats, flax, millet, winter wheat, and rye are also grown. Spring wheat, sunflowers, and soybeans are grown as cash crops. Corn is grown as a cash crop and as livestock feed.

The paragraphs that follow describe the management needed on the cropland in the county:

Water erosion is a problem on some of the cropland in Spink County. If slope is more than 2 percent, water erosion is a hazard on Forman, Great Bend, Hand, Kranzburg, Max, and other soils. Loss of the surface layer through water erosion reduces the productivity of the soil and can result in the pollution of surface water sources by sediment. Productivity is also reduced when the more fertile surface layer is lost and part of the subsoil is incorporated into the plow layer. Loss of the surface layer is especially damaging on soils that have a claypan subsoil, such as Cavour, Dudley, Nahon, and Noonan, and on soils that have a thin surface layer, such as Buse, Ethan, Zahl, and Zell. Erosion also reduces the productivity of soils that tend to be droughty, such as Delmont, Lehr, and Renshaw. When erosion occurs, sediments rich in nutrients and possible pesticides enter streams, lakes, and potholes. Phosphorus loading of surface waters by surface runoff and sediments is a major concern in South Dakota. Measures that control water erosion minimize the pollution of streams and lakes by sediment and preserves water quality for fish and wildlife, recreation, and municipal use. Measures that control water erosion also reduce the amount of fertilizer needed in cropped areas by helping to prevent the removal of plant nutrients and movement of agrochemicals.

Pesticide and nutrient runoff is a limitation that increases the hazard of contaminating surface waters, such as lakes, streams, and rivers. It can be managed with nutrient, pesticide, and conservation tillage systems which include leaving crop residue on the surface, following pesticide labels, and fertilizing based on soil nutrient testing. Limiting row crops on slopes of more than 8 percent reduces the rate of runoff of pesticides and nutrients. Runoff from upland areas can concentrate pesticides on ponded soils and level flood plains.

Using a conservation cropping system that keeps a protective cover of vegetation on the surface for extended periods can help to hold soil losses to an amount that does not reduce the productive capacity of the soils. Careful management of crop residue is necessary (fig. 13). Minimizing tillage and leaving crop residue on the surface increase the rate of water infiltration, reduce the runoff rate, and help control water erosion. Combined with grassed waterways, these practices are suitable on most of the soils in the county.

Terraces and diversions reduce the runoff rate and help to control erosion by reducing the length of slopes. These measures are most practical on very deep, well drained soils that have long, smooth slopes, such as Great Bend and Kranzburg. Many areas in Spink County, however, are poorly suited to terraces and diversions because the slopes are short and irregular. In these areas, cropping systems that maintain a substantial amount of plant cover on the surface are needed. Grassed waterways are effective in controlling gully erosion.



Figure 13. Sunflowers in an area of Hand-Ethan-Bonilla loams, 1 to 6 percent slopes, that were no-tilled into standing wheat stubble.

Wind erosion is a hazard on many of the soils in the county. The hazard is greatest on soils having a fine sandy loam, loamy fine sand, or fine sand surface layer, such as Carthage, Eckman, Egeland, Els, Elsmere, Embden, Forestburg, Gardena, Hand, and Ipage. Soils that have a high content of lime in the surface layer such as Bearden, Buse, Ethan, Hamerly, Rondell, Zahl, and Zell, are also highly susceptible to wind erosion. Due to the high content of lime, the soil aggregates are about the size of fine sand. These soils can be damaged in a few hours if the winds are strong and the soils dry and not protected by a plant cover or surface mulch. If a soil crust resulting from a previous rain is present, it must be able to withstand impact without deteriorating. Soils with silt loam textures, such as Bearden, Great Bend, and Zell are susceptible to soil crusting. An adequate organic matter content, adequate plant cover, a cover of crop residue, stripcropping, and a rough surface help to control wind erosion. Windbreaks of suitable trees and shrubs also are effective in controlling wind erosion.

Information about the measures that control wind and water erosion on each kind of soil is contained in the Field Office Technical Guide (FOTG), available online at www.nrcs.usda.gov/technical/efotg and in the local office of the Natural Resources Conservation Service or from the Agricultural Experiment Station at South Dakota State University.

Wetness is the major limitation on the poorly drained Lamoure, Ludden, Tetonka, and Tonka soils. These soils are better suited to late-planted crops such as corn, soybeans, or sunflowers. Maintaining existing drainage systems helps remove excess water. Controlling runoff from adjacent soils also helps to reduce the wetness of these soils and agrochemical movement in these soils.

The moderately well drained Aastad, Arnegard, Bonilla, Brookings, and Prosper soils occur on footslopes of till plains and receive additional moisture when water runs off higher lying adjacent soils. The moderately well drained Bon, La Prairie, and LaDelle soils are on flood plains and receive additional moisture when streams occasionally flood. Tillage and planting are delayed in the spring during wet years, but in most years natural drainage is adequate and the additional moisture is beneficial for crops. Agrochemical movement can occur on footslopes and flood plains with prolonged flooding.

Fertility helps determine the level of yields. It can be improved by applying fertilizer and by including grasses and legumes into the cropping system. In soils that have a high content of lime in the surface layer, such as Bearden, Buse, Hamerly, Rondell, Zahl, and Zell, the kinds and amounts of fertilizer should be based on the results of soil tests, on the needs of the crop, and on the expected yield level. The South Dakota Cooperative Extension Service or the Agricultural Experiment Station at South Dakota State University can help in determining the kinds and amounts of fertilizer needed, and the preferred time and method of application. The recommended methods vary by crop, soil, climatic conditions, location of field, depth to an aquifer, and distance to surface water sources. Agrochemical use on soils which are sensitive to leaching and soils on steep slopes should be carefully monitored to avoid environmental problems. The leaching of nitrates and pesticides is most commonly associated with soils that have moderately rapid to very rapid permeability, such as Bowdle, Delmont, Dimo, Egeland, Embden, Enet, Fordville, Lehr, Maddock, and Renshaw. Following a nutrient and pesticide management plan can help control the potential leaching of chemicals into ground water. A nutrient and pesticide management plan follows pesticide labeling and fertility recommendations based on soil nutrient tests. The key to preventing large nitrogen losses to ground water is to minimize the amount of nutrients in soils that are not used by the present crops. Timing nitrogen applications close to crop utilization will reduce the risk of losses by shortening the time available for leaching (Gerwing, et al, 1993). Soils that have steep slopes have a high potential for water erosion.

Soil tilth is an important factor in the germination of seeds and the infiltration of water into the soil. Soils with good tilth are granular and porous. If tilled when wet, Beadle, Harmony, and Peever soils tend to be very cloddy when dry. As a result of the cloddiness, preparing a good seedbed is difficult. These soils dry out slowly in the spring and lose tilth if they are tilled when wet. Tilth also is poor in claypan (natric) soils, such as Aberdeen, Cavour, Cresbard, Dudley, Exline, Ferney, Jerauld, Miranda, Nahon, Niobell, Noonan, and Stickney. Timely tillage, including grasses and legumes in the cropping system, and incorporating crop and other organic residue into the soil help improve tilth and increase the rate of water intake.

Soil compaction is the compression of soil particles. When compaction occurs in the surface layer or subsoil, aeration is impaired and plant roots have more difficulty pushing through the soil to search for water. Soil conditions that affect the potential for compaction are wetness and content of more than 35 percent clay in the upper 10 inches.

Managers can have a positive influence on soil tilth and compaction by including high residue crops in the rotation, limiting vehicle and livestock traffic when the soils are wet, incorporating residue, and reducing tillage. The timing of farming operations is critical. If compaction has occurred, it can be reduced through ripping or deep plowing.

Sodium-affected soils such as Cavour and Noonan have additional management problems. They have slow and very slow permeability, are less productive, have high pH values which limit nutrient availability, and are restrictive to root and moisture penetration because of the dense compact subsoils along with tilth and compaction concerns. Management of sodium-affected soils needs to involve timely tillage, minimal tillage, crop residue left on the surface to maintain organic matter content levels, and maintaining tilth. Rotations including grasses and legumes will help maintain organic matter content, fertility, and tilth. Chiseling and subsoiling when the soil is dry will help increase permeability.

Field crops suited to the survey area include small grain and row crops. Spring wheat is the main small grain crop. Flax, oats, rye, and winter wheat are also grown. Corn, soybeans, and sunflowers are the main row crops. Corn is grown mainly for grain with some harvested for silage.

All commonly grown and climatically suited crops are suited to the very deep, well drained or moderately well drained soils such as Aastad, Arnegard, Beotia, Bonilla, Brookings, Forman, Great Bend, Hand, Kranzburg, La Prairie, LaDelle, and Max. Egeland and Maddock soils are better suited to small grains, which provide better protection against wind erosion than row crops. Bowdle, Delmont, Enet, Fordville, Lehr, and Renshaw soils are better suited to early-maturing small grain than to deep-rooted late maturing crops such as corn, because the porous underlying material limits the available water capacity and the depth to which roots can develop. The soils that have sand or sand and gravel subsoils have a high potential for leaching of agrochemicals into ground water aquifers.

Irrigation Management

There are 176 center pivots in Spink County which annually pump about 15,000 acre-feet of water from the underlying glacial aquifers. Over 88 percent of the water comes from the Tulare Aquifer (Hamilton and Howells, 1996). The two main irrigation management concerns are the quality of the water and the internal drainage of the soil (Fine, et. al., 1977).

The ground water quality of the glacial aquifers varies widely, both within and between aquifers and, in many places, with depth at a given time (Hamilton and Howells, 1996). At certain locations the Niobrara Aquifer discharges sodium-rich water into the Tulare Aquifer and thus it becomes unsuitable for irrigation purposes. The elevated levels of sodium in the Tulare Aquifer are most common in the following townships in Spink County; Lincoln (T. 115 N. R. 62 W.), Harrison (T. 115 N. R. 61 W.), Antelope (T. 114 N. R. 61 W.), and Cornwall (T. 114 N. R. 62 W.). The physical and chemical properties of the soils in some fields in this area have been severely altered as a result of sprinkler irrigation with high-sodium ground water. Refer to the "Management of Saline and Sodic Soils" section on how to reclaim these soils. The initial step in reclamation of the problem areas is discontinuation of irrigation on these sites.

The main soil types that are being irrigated in Spink County include: Beadle, Beotia, Carthage, Delmont, Enet, Great Bend, Hand, and Stickney. The Carthage, Delmont, Enet, and Hand soils have a high infiltration and permeability rate and are fairly well suited for irrigation. Since these soils have a low amount of clay in the soil profile, they are less affected by poor quality water. The Beadle and Stickney soils have slow permeability in the subsoil and require sound water management in that only enough water is applied to obtain maximum productivity. This is also the case with Beotia and Great Bend soils which have slow permeability in the (varved) underlying material. These soil types cannot tolerate poor quality water because the salts applied to the soil cannot move through the slowly permeable subsoil and underlying material. Salts become concentrated in the root zone.

Management of Saline and Sodic Soils

Saline soils are characterized as having sufficient soluble ($EC > 4$ mmhos/cm) salts to adversely affect the growth of most plants (Brown, et. al., 1982). The majority of the saline soils in Spink County are located on side hills as a result of saline seeps or adjacent to potholes as a result of restricted drainage. Saline soils make up less than 2,000 acres in Spink County.

Saline seeps are most commonly associated with the Huffton and Putney soils. These areas are conducive to saline seeps because of the layered effect (varves) of the lacustrine geologic material. The lacustrine sediments consist of thin alternate layers of silt, sand, and clay and are strongly calcareous and usually moderately saline. Saline seeps start to form when precipitation exceeds water-holding capacity

of the soil and the water starts to move through the root zone. As the water percolates downward, salts are dissolved, and a saline water table forms above the thin, slowly permeable strata of clay. The underground saline water moves downslope and dissolves more salts, until it appears at the soil surface on the side slope. As the water evaporates, a buildup of salts accumulate at or near the surface, which impede plant growth.

Saline seeps are best controlled by seeding alfalfa to stop the flow of water to the saline seep. Alfalfa roots are able to penetrate deep into the soil profile and take up large amounts of water which eliminates the flow of water to the saline seep. Reclamation of the saline seep area can begin once the flow of the water has been stopped. A salt-tolerant crop, such as barley, or salt-tolerant grasses, such as tall wheatgrass or beardless wildrye should be seeded in the saline area. The addition of organic matter will also aid the reclamation of the saline area. Careful monitoring of the amount of water moving through the soil profile should ensure that the saline seep does not recur.

The saline areas adjacent to potholes are most commonly associated with the Colvin, Davison, Glyndon, Hamerly, Rondell, and Vallers soils. Because of restricted drainage and hydrology, salts rise from the water table and are concentrated near the surface. This salt buildup is reduced by plant growth and residue cover. The plant roots are able to use the soil water before it reaches the surface thus preventing the salt accumulation, while the residue cover prevents evaporation and the movement of the water to the surface.

Plant response, particularly during periods of soil moisture stress, is a useful indicator of the degree of salinity. Reclamation of the area is best achieved with a continuous cover which will reduce evaporation and salt accumulation in the surface layer. Whether the continuous cover consists of a crop and its residue or grasses is dependent on the level of the salinity. Slightly or moderately saline soils are suited to salt-tolerant plants (barley, crested wheatgrass, or slender wheatgrass). Strongly saline soils are best suited to native grass such as western wheatgrass or alkali sacaton or to salt-tolerant introduced grasses such as tall wheatgrass.

Sodic soils are characterized by a high content ($SAR > 13$) of exchangeable sodium which adheres to the clay particles in the soil. Sodic soils have layers in the profile that impede air, water, and root movement into and through the soil (Bischoff, et al, 1998). The sodic soils in Spink County are Aberdeen, Cavour, Cresbard, Dudley, Durrstein, Exline, Farmsworth, Ferney, Harriet, Heil, Hoven, Jerauld, Miranda, Nahon, Niobell, Noonan, Northville, Ranslo, and Stickney. Over 350,000 acres of the county are comprised of sodic soils. Locally, sodic soils are known as "black alkali," "slick spots," "pan spots," or "gumbo."

If plowed, sodic soils are characterized by a surface layer that is sticky when wet and hard and cloddy when dry. A crust forms easily at the surface. The chemical and physical properties of these soils are unfavorable for plant growth. The harmful effects of the properties on plants generally increase as the sodium content increases and the depth to the dense, sodic subsoil decreases. The effects of the reduced amount of water available to plants are more harmful than the toxic effect of the sodium. The effects of sodium-affected soils on plant growth are influenced by weather conditions, stage of plant growth, and soil moisture status.

Identification of sodic soils in cultivated fields commonly is difficult because many of the physical characteristics, such as columnar structure, have been altered by tillage. Plant response, particularly during periods of soil moisture stress, is a useful indicator of the level of sodicity in a soil. Plants grown on soils with varying amounts of sodium and varying depths to the dense, sodic subsoil exhibit varying heights and stages of development. Soils that have a dense, sodic subsoil near the surface (Durrstein, Exline, Ferney, Jerauld, Harriet, Heil, Hoven, Jerauld, and Miranda) are better suited to grass than crops.

Deep plowing, chemical amendments, and adding organic matter can help to reclaim sodic soils. To be effective, deep tillage should reach below the sodic subsoil and mix several inches of the underlying material with the subsoil and topsoil (Fine, et. al., 1978). Depending on the soil, tillage to a depth of 15 to 36 inches may be needed. Onsite investigation is needed to confirm the appropriateness and feasibility of deep tillage in a particular area. Added organic matter is always beneficial when working with sodic soils (Bischoff, et. al., 1998). Crop residue, manure, straw, green manure crops, and old hay help lower the soil pH which decreases the exchangeable sodium near the surface. Any reclamation of sodic soils is a long-term endeavor. Complete reclamation may never be achieved.

Additional information about the management or reclamation of saline or sodic soils is available from the Natural Resources Conservation Service, the South Dakota Cooperative Extension Service, and the Agricultural Experiment Station at South Dakota State University.

Pasture and Hayland

David W. Schmidt, range conservationist, Natural Resources Conservation Service, helped prepare this section.

Pasture and hayland are lands used for the production of adapted domesticated perennial forage plants to be grazed by livestock or harvested for hay. These forage plants can be either native or introduced species, seeded alone or in a mixture. Generally, these species are established as part of a long-term forage program but may include lands established to legumes or grasses as part of a short-term crop rotation.

Currently, about 7 percent of the county is classified as pasture and hayland (USDA, 1987). These lands supply a major portion of the forage for livestock. Included in these acreages are areas which were once native vegetation that have been invaded by introduced tame grasses such as smooth brome grass. These species have invaded the sites due to overgrazing. Managing these sites as native rangeland is no longer practical in many instances. Many of the pasture and hayland acres within the county are presently producing well below their potential due to overgrazing, improper hayland management, and poor agronomic practices.

Proper pasture and hayland management techniques will assure maximum sustained yields. Proper stocking rates will allow the pasture plants to remain vigorous. Pastures which are overgrazed will lose vigor due to depleted root systems. If overuse is continuous, the plants will eventually die and be replaced by less desirable species and weeds. Planned grazing systems which include periods of adequate rest or deferment for the key pasture species will help improve plant vigor and improve production. Rest periods between grazing will allow pasture plants to regrow and replenish energy reserves. Haying at the proper stage of plant growth will maintain plant vigor. Generally, plants should be hayed at early to mid bloom stage. Grazing pasture species at the proper stage of growth will also increase plant vigor and production. Grazing a plant before it has produced enough leaf material to replenish stored energy reserves will reduce vigor and production. Generally, plants should be allowed to grow to a height of eight to fourteen inches before grazing. This is dependent on the species managed. Plants should also not be allowed to become too tall or mature before the initiation of grazing. If this happens, forage quality and to some extent quantity will decline. Plants should also be allowed to regrow before the first killing frost. This will allow the plants to enter into winter with adequate energy reserves to survive the winter and initiate growth the following spring. Production the following year will improve. In addition, the regrowth will trap snow thus increasing soil moisture.

Planting species to match the season of use is important. Pasture and hayland species can be divided into two broad categories. Cool-season species begin their growth in the early spring and end growth in early summer. They may regrow again in the fall when temperatures cool if adequate soil moisture is present. Warm-season species begin growth in the early summer. They produce the majority of their forage during the hot summer months. Examples of cool-season plants include smooth brome grass, intermediate wheatgrass, and alfalfa. Examples of warm-season species include big bluestem and switchgrass. The producers wishing to have a high-producing, nutritious forage source for their livestock during July and August would want to choose a species such as big bluestem. If a cool-season species such as smooth brome grass is utilized during this period, reduced livestock performance will be the result.

In order to maintain optimum production, pasture and hayland will occasionally need to be reestablished. The amount of time that pasture and hayland remain productive depends on the plant species, soil, climatic factors, and management. Generally speaking, many of the tame species will need to be replaced on a 5- to 10-year basis. Native species which are adapted to the site will generally remain productive for an extended period of time. This is highly dependent on the pasture and hayland management techniques used. Species selection should be matched to the soils and producer needs. The use of improved varieties will often lead to increased production and improved forage quality and stand establishment as well as increased longevity of the stand.

Maintaining the fertility of the soil is imperative in managing these lands. Soils should be fertilized on the basis of soil tests to reduce the threat of contaminating water supplies and assuring economic feasibility. Fertilizing at proper levels will increase production and the longevity of the stand and improve the quality of the forage. Legumes such as alfalfa, when planted with grasses, will often provide sufficient nitrogen to meet the needs of grass species.

Poor management can result in weeds becoming a problem on pasture and hayland. Overgrazing, poor fertility, and using species not adapted to the site will lead to increased weed pressure. Weeds which do appear should be controlled within economical constraints.

Pasture and hayland yields are dependent on the species, species variety, site, previous management, fertility, and climatic factors. Yields can be optimized by utilizing the management techniques discussed above. Soil compaction is a potential problem on clayey soils if grazed when wet.

The soils in the county were placed in forage suitability groups. A description was developed for each group. The forage suitability group descriptions are broad enough to include all soils in the group. These descriptions include those features common to the soils in a specific group which affect the management and yields of those soils when used as pasture or hayland. The principal criteria used for placement of soils in a group include depth, drainage, texture, structure, permeability, available water capacity, position on the landscape, and special internal features. The description includes a statement indicating the major hazards and limitations of the soils in the group when used for hay and pasture. It also contains a list of species best suited to the group. The species listed were selected for their yield potential, adaptability to the site, palatability, and relative ease of establishment. These descriptions can be utilized when making decisions on land use conversions and species selection. For more detailed information consult the local Natural Resources Conservation Service office or the Agricultural Experiment Station at South Dakota State University.

At the end of each description under the heading "Detailed Soil Map Units" and in the "Interpretive Groups" table, the soils are assigned to forage suitability groups. The paragraphs below describe the forage suitability groups:

Clayey Subsoil. These soils are in the backslope, footslope, and toeslope landscape positions. This group consists of moderately well and well drained, medium to fine textured soils found on till plains, lake plains, and flood plains. Permeability is very slow to moderately slow, resulting in increased runoff, erosion potential, and droughtiness. Some of the soils have moderate salinity in the subsoils. When establishing new or renovating older stands, select species adapted to grow in tight, slowly permeable soils. Well suited species include alfalfa, big bluestem, crested, tall, and western wheatgrasses, green needlegrass, meadow and smooth brome grasses, Russian wildrye, and switchgrass. Including sod forming grass species, especially on steeper slopes, will reduce the potential for sheet and rill erosion. Incorporate erosion control practices during the establishment period. Locate fences, lanes, and water developments to control livestock movement, reduce trailing perpendicular to steeper slopes, and evenly distribute grazing pressure.

Claypan. The soils in this group are found on nearly level positions of till plains, lake plains, flood plains, and on stream terraces. The group consists mostly of somewhat poorly and moderately well drained, fine to medium textured soils formed in glacial till, lacustrine deposits, or alluvium. They have claypan subsoils with slow permeability. The underlying material and lower part of the subsoil typically have high amounts of soluble salts and are sodic. The claypan and the soluble salts and sodicity in the subsoil produce an unfavorable rooting environment, limiting species selection and production potential. The impact on yields can be reduced by selecting forage species, such as tall and western wheatgrasses, that are tolerant of salinity and sodicity and can root in dense, clayey subsoils. Locate fences, lanes, and water developments to control livestock movement, reduce trailing, evenly distribute grazing pressure, and reduce bare areas.

Droughty Loam. The soils in this group are mostly found on lake plains, outwash plains, till plains, or over bedrock. The group consists of moderately deep to very deep, well drained, moderately coarse to medium textured soils formed in loamy and sandy materials deposited by wind or water. Available water capacity is in the moderate range due to moderately coarse soils textures or moderate depth to sand and gravel or bedrock, which limits plant growth during periods of moisture deficit. When establishing new or renovating older stands, select forage species that are tolerant to periods of drought and inadequate soil moisture. Well suited forages include alfalfa, crested, intermediate and western wheatgrasses, green needlegrass, little bluestem, Russian wildrye, sideoats grama, and white and purple prairie clovers. Including sod forming grass species in stands, especially on steeper slopes, will reduce the potential for sheet and rill erosion. Incorporate both wind and water erosion control practices during the establishment period. Properly locate fences, lanes, and water development to control livestock movement, reduce trailing perpendicular to steeper slopes, and evenly distribute grazing pressure.

Limy Upland. The soils in this group are found on till plains, moraines, and lake plains. These soils are typically in the shoulder and backslope landscape positions. The group consists of very deep, mostly well drained, medium textured soils formed in glacial till or lacustrine deposits that are calcareous in the upper layers. The high lime content reduces the availability of some plant nutrients and reduces species choices and yield potential. Also, because most of these are sloping soils on ridges and knobs, they are subject to water and wind erosion, and tend to be droughty. When establishing new or renovating older forage stands, select species that can

tolerate high lime. Include sod forming grass species on steeper slopes to reduce the potential for sheet and rill erosion. Suited species include alfalfa, little bluestem, crested and tall wheatgrasses, sideoats grama, and purple prairie clover. Incorporate both wind and water erosion control practices during the establishment period. Locate fences, lanes, and water developments to help control livestock movement, reduce trailing, and evenly distribute grazing pressure.

Loam. The soils in this group are located on upland positions of till plains and moraines. They are also found on lake plains and glacial stream terraces. The group consists of very deep, moderately well and well drained, moderately coarse to moderately fine textured soils formed mostly in glacial till, lacustrine deposits, or alluvium. Available water capacity is generally high, but may be moderate in moderately well drained soils. Permeability is moderately slow to moderately rapid. These soils have few limitations to the production of climatically adapted forage crops. Well suited species include alfalfa, big and little bluestems, crested, intermediate and western wheatgrasses, green needlegrass, Indiangrass, meadow and smooth brome grasses, purple and white prairie clovers, red clover, sideoats grama, and switchgrass. Water erosion is a potential problem during establishment, when renovating stands, and in thin established stands. Including sod forming grass species in stands, especially on steeper soils, will reduce the potential for sheet and rill erosion. Incorporate erosion control practices during the establishment period. Properly locating facilitating practices such as fences, lanes, and water developments can help control livestock movement, reduce trailing perpendicular to steeper slopes, and evenly distribute grazing pressure.

Not Suited. The soils in this group are found in various landscape positions. They possess one or more physical or chemical properties that make their economic use for forage production difficult or impossible. They are too steep, shallow, wet, stony, or possess unfavorable chemical properties. If the conditions that caused them to be placed in this group have been corrected, the soils should be managed the same as the group that most closely resembles them without the restrictions. For instance, if a soil has been placed in this group because of stoniness and the stones have been removed, it should be managed under the same group as the non-stony phase.

Overflow. These soils are found in toeslope positions and in swales and drainageways on uplands. The group consists of very deep, mostly moderately well drained, moderately fine to medium textured soils formed in glacial till, lacustrine deposits, or alluvium. Permeability is moderately slow to moderately rapid, and available water capacity is high. The group receives beneficial additional moisture as run-on from upslope or from flooding. Also, many of these soils have a seasonal water table within 3 feet of the surface which benefits deep-rooted plants. These soils have few limitations to the production of climatically adapted forage crops and production potential is high. When establishing new or renovating older stands select highly productive species and varieties that can make best use of the additional soil moisture this group receives. Well suited species include alfalfa, big bluestem, birdsfoot trefoil, crested, intermediate, and western wheatgrasses, green needlegrass, Indiangrass, meadow and smooth brome grasses, red clover, and switchgrass. Exclude livestock and machinery during periods of soil wetness to reduce compaction. Locate fences, lanes, and water developments to help control livestock movement, reduce trailing, and evenly distribute grazing pressure.

Saline. Most of these soils are found on level and nearly level glacial lake plains, flood plains, and terraces. The group consists mostly of somewhat poorly and poorly drained soils with elevated salinity. Species selection and productivity are severely limited by salinity and wetness. When establishing new or renovating older stands

select species that are tolerant of poorly drained, saline soils. Adapted species include beardless wildrye, slender, tall, and western wheatgrasses, and strawberry clover. Exclude livestock and machinery during extended periods of soil wetness to reduce soil compaction. Locate fences, lanes, and water developments to control livestock movement, reduce trailing, evenly distribute grazing pressure, and reduce bare areas.

Sand. The soils in this group are found on lake plains, outwash plains, and on sand-mantled till sites. They consist of very deep, moderately well to excessively drained, coarse textured soils formed in sandy eolian and alluvial materials. Permeability is mostly rapid and available water holding capacity is low. Soil blowing is a severe hazard during establishment or renovation of forage stands. Bare areas where livestock concentrate are also susceptible. Production potential is limited due to the droughtiness and low native fertility of these soils, and forage species choices for pasture and hayland are somewhat limited. Select forage species that are highly tolerant to periods of drought and inadequate soil moisture and can grow on coarse soils. Suited species include Canada wildrye, cicer milkvetch, meadow brome grass, little and sand bluestems, prairie sandreed, and purple and white prairie clovers. Incorporate wind erosion control practices during stand establishment. Locate fences, lanes, and water developments to control livestock movement, reduce trailing, evenly distribute grazing pressure, and reduce bare areas.

Subirrigated. The soils in this group are found on level and nearly level lake plains, outwash plains, till plains, and flood plains. They can also occur in swales and depressions of upland areas. They are moderately fine to coarse textured and mostly somewhat poorly drained. They have a seasonal water table within 12 to 48 inches of the surface during part of the growing season. Production potential is high. Some of the soils are limy, and due to upward movement of water some may become saline during extended wet periods. Forage species, such as alfalfa, that are less tolerant of saturated soils may suffer stand loss during wet years. Well suited species include big and little bluestems, birdsfoot trefoil, Indiangrass, meadow and smooth brome grasses, reed canarygrass, western wheatgrass, and switchgrass. Excluding livestock and machinery during extended periods of soil wetness will help reduce soil compaction. Locate fences, lanes, and water developments to help control livestock movement, reduce trailing, and evenly distribute grazing pressure.

Very Droughty Loam. The soils in this group are found on level to moderately sloping positions on outwash plains, eskers, kames, terraces, beach ridges, till plains, and moraines. They consist of well to excessively drained, medium to moderately coarse textured soils that are moderately deep to bedrock or moderately deep to shallow over sand and gravel. Available water capacity is low due to the depths to sand and gravel or bedrock, resulting in limited species selection and production potential. Yield impacts can be reduced by selecting forage species that are highly tolerant to periods of drought and inadequate soil moisture. Suited forage species include crested and intermediate wheatgrasses, little bluestem, purple and white prairie clovers, and smooth brome grass. Including sod forming grass species in stands, especially on steeper slopes, will reduce the potential for sheet and rill erosion. Incorporate both wind and water erosion control practices during the establishment period. Properly locate fences, lanes, and water developments to control livestock movement, reduce trailing perpendicular to steeper slopes, and evenly distribute grazing pressure.

Very Shallow to Gravel. The soils in this group are found on level to moderately sloping positions on lake plains and outwash plains, eskers, kames, terraces, beach ridges, and moraines. They are moderately well to excessively drained, medium to

moderately coarse textured soils that are shallow over sand and gravel. Their primary limitation is very low available water capacity due to shallow depth to sand and gravel which results in severely limited species selection and production potential and difficulty maintaining vigorous forage stands. Suited species include western, pubescent and crested wheatgrasses, little bluestem, and purple and white prairie clovers. Wind and water erosion are potential problems during establishment, when renovating stands, and in thin established stands. Livestock trail erosion is a potential problem on established stands. Properly locate fences, lanes, and water developments to control livestock movement, reduce trailing perpendicular to steeper slopes, and evenly distribute grazing pressure. Where these soils are protected by native or introduced vegetation, the existing stand should be managed to maintain or increase vigor. Where these soils are cultivated, returning them to rangeland may be a better alternative than pasture or hayland.

Wet. The soils in this group are found in swales and depressions on flood plains, lake plains, and outwash plains. The group consists of poorly drained, coarse to fine textured soils that are ponded during a portion of the year or have a seasonal water table at or near the surface during part of the growing season. The primary limitation for these soils is wetness, which may severely limit species selection and delay planting and harvesting of forage crops. When establishing new stands or renovating older stands, select species that are tolerant of poorly drained soils. Adapted species include creeping foxtail and reed canarygrass. Exclude livestock and machinery during wet periods to reduce rutting and soil compaction. Locate fences, lanes, and water developments to control livestock movement, reduce trailing, evenly distribute grazing pressure, and reduce bare areas.

Productivity Ratings and Crop Yield Estimates

Productivity ratings are relative ratings of the ability of a soil to produce a particular crop in comparison to another. They are useful in estimating long-term average crop yields, comparing the production capacity of soils, and in various economic analyses. Productivity ratings are shown in the "Soil Productivity Ratings" table.

Productivity ratings are based on soil properties important to crop and range production. Experiences of soil scientists, conservationists, and university researchers are used to develop the ratings. Results from field trials, demonstrations, and records and experiences from producers are also considered.

The ratings developed in this report are comparative ratings, and they apply to the soil mapping units in Spink County. The soil mapping unit ratings are for local use and will differ from soil mapping unit ratings in adjacent or nearby counties.

Soil ratings determined by the methods described in this publication compare soils and should not change relative to each other with fluctuations in economic conditions since they are based on the physical and chemical properties of soils. Advancement in technology also should not greatly alter the ranking of soils, because soils tend to behave similarly. The potential yield advantage of one soil over another usually does not change because a new form of fertilizer, a new grain variety, a new tillage system, or a new pest management program has been developed.

The data used to determine productivity ratings include crop and range yields, range composition, and other soils information published in this soil survey. Forage use values were provided by the South Dakota Agricultural Experiment Station at South Dakota State University. There are four steps used to calculate soil productivity ratings (Malo, 1996):

1. Determine a comparative crop rating for each soil mapping unit suited for crop production.
2. Determine the amount of useable grass (range) forage available for each soil mapping unit (total range yield x forage use value factor). Since not all native forage is useable by livestock, a forage use value factor (based on the plant species present) is calculated for each soil series.
3. Determine the grass/range rating for each soil mapping unit. Grass/range ratings are equated to crop rating by using a balance point factor. The rating is for potential palatable vegetation.
4. Determine a soil productivity rating that reflects the highest and best use for each soil mapping unit. The soil productivity rating is equal to the highest value of either the final crop rating or the grass/range rating.

The crop ratings, range ratings, and soil productivity ratings developed using the methods listed above are found in the "Soil Productivity Ratings" table. Use the soil productivity rating appropriate for the specific soils and soil conditions present at the site being evaluated.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in "Yields per Acre of Crops" table. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of each map unit also is shown in the "Interpretive Groups" table.

The yields are based mainly on the experience and records of farmers, conservationists, university researchers, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include cropping sequences that will efficiently use the available moisture, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and other essential elements for each crop; effective use of plant residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in the table are grown in the county, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service, the South Dakota Cooperative Extension Service, or the South Dakota Agricultural Experiment Station at South Dakota State University can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for pasture and hayland, for rangeland, for woodland, and for engineering purposes.

In the capability system, soils are generally grouped at three levels - capability class, subclass, and capability unit (USDA, 1961). These levels are defined in the following paragraphs.

Capability classes, the broadest groups, are designated by numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

- Class I** soils have few limitations or hazards that restrict their use.
- Class II** soils have moderate limitations or hazards that reduce the choice of plants or that require moderate conservation practices.
- Class III** soils have severe limitations or hazards that reduce the choice of plants or that require special conservation practices, or both.
- Class IV** soils have very severe limitations or hazards that reduce the choice of plants or that require very careful management, or both.
- Class V** soils are not likely to erode but have other limitations or hazards, impractical to remove, that limit their use.
- Class VI** soils have severe limitations or hazards that make them generally unsuitable for cultivation.
- Class VII** soils have very severe limitations or hazards that make them unsuitable for cultivation.
- Class VIII** soils and miscellaneous areas have limitations or hazards that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, **e**, **w**, **s**, or **c**, to the class numeral, for example, IIe. The letter **e** shows that the main limitation or hazard is the risk of erosion unless close-growing plant cover is maintained; **w** shows that water in or on the soil interferes with plant growth or cultivation; **s** shows that the soil is limited mainly because of a root zone limitation (e.g. shallow, saline, too clayey, too sandy, droughty, or stony); and **c**, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations or hazards. Class V contains only the subclasses indicated by w, s, or c because the soils in class V are subject to little or no erosion. They have other limitations or hazards that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe-4 and IIIe-6. The capability units are not numbered consecutively because not all the

units in the land capability system are represented in the county. Capability units are not designated in this soil survey.

The capability classification of each map unit is given in the section "Detailed Soil Map Units" and in the "Interpretive Groups" table.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use and protection of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forest land, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to environmentally and economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. The slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

About 370,000 acres in the county, or nearly 38 percent of the total acreage, meets the soil requirements for prime farmland. Scattered areas of this land are throughout the county, mainly in associations 2, 3, and 17, which are described under the heading "General Soil Map Units." Almost all the prime farmland is used for crops, mainly corn, soybeans, and spring wheat.

The map units in the county that are considered prime farmland are listed in the "Prime Farmland" table. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is shown in the "Acreage and Proportionate Extent of the Soils" table. The location is shown on the detailed soil maps. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Rangeland

David W. Schmidt, range conservationist, Natural Resources Conservation Service, helped prepare this section.

Rangeland supports native vegetation suitable for grazing or browsing. It includes areas where native vegetation has been reestablished. The vegetation is mainly grasses, grasslike plants, forbs, or shrubs. The amounts and kinds of native vegetation grown in any one area are determined by the soil, topography, climate, past use, and management.

All of the county was rangeland before the first European settlers arrived. Currently, about 22 percent of the county supports native vegetation (USDA, 1987). This rangeland supplies a portion of the forage for livestock in the county. Approximately 36 percent of the farm and ranch income in the county is derived from the sale of livestock and livestock products (USDC, 1997). Most of the livestock enterprises are cow-calf operations. Some are yearling operations and some combine their cow herds with yearlings. This practice permits greater flexibility in adjusting livestock numbers during periods of drought. Sheep are found in limited numbers throughout the county and are often run in combination with cow herds. The rangeland is generally grazed from May to October. The forage provided by rangeland is generally supplemented by crop aftermath and tame pasture plants, such as intermediate wheatgrass and smooth brome grass. In winter, it is supplemented by protein concentrate and hay.

Spink County is part of the mixed grass prairie. The native vegetation is dominated by mid grasses and forbs, but tall and short grasses and forbs are interspersed with these plants. (Baumberger, 1977). Common mid grass species include little bluestem, sideoats grama, and green needlegrass. Goldenrod and prairieclover are common forbs. The mixed grass prairie consists of cool- and warm-season plants which provide good quality forage throughout the growing season. The cool-season plants grow mostly during April, May, and June. The warm-season plants grow mostly during June, July, and August. The cool-season grasses may start growing again in September and October if autumn rainfall and soil moisture are adequate.

The native vegetation in many parts of the county is producing below its potential because of past misuse. The tall grasses and some of the mid grasses have been replaced by less desirable plants. In many areas of the county, the past misuse of the native vegetation has led to an invasion of cool-season tame grasses, namely smooth brome grass and Kentucky bluegrass. The result is a total reduction of available forage. In most areas, however, enough of the original plants remain for good grazing management to reestablish the high quality native plants.

Ecological Sites and Condition Classes

Different kinds of soil vary in their capacity to produce native vegetation. Soil properties that affect moisture supply and plant nutrients have the greatest influence on the productivity of range plants. Soil reaction, salt content, and a seasonal high water table are also important. Soils that produce approximately the same kinds, amounts, and proportions of native vegetation make up an ecological site. The potential native vegetation on an ecological site is the stabilized plant community that the site is capable of producing. It consists of the plants that were growing on the site when the region was settled. This plant community maintains itself and changes very little as long as the environment remains unchanged. The relationship between soils and vegetation was ascertained during this survey; thus ecological sites generally can be determined directly from the soils map.

The plants within the native plant community are sometimes grouped as decreaseers, increaseers, and invaders, depending on their response to grazing pressure. Decreaseers are plants that respond to overgrazing by decreasing in abundance. They generally are the most productive plants and the ones most preferred by the grazing animals. Increaseers are plants that respond to grazing pressure, at least initially by increasing in amount as the more desirable decreaseer plants become less abundant. Increaseers, generally, are less productive and less preferred by the grazing animal. Invaders are plants that are not part of the original plant community but invade because of some kind of disturbance or continued overgrazing. Some invader plants have little or no value for grazing.

Because plants do not respond in the same manner to different influences, a plant may be a decreaser on some ecological sites but an increaser on others. A cool-season plant, for example, may be a decreaser if the site is grazed only during the spring but would be an increaser if the same site were grazed only during the summer. The reverse would be true for the warm-season plants. Grazing only during the spring would cause the warm season plants to increase in abundance, and grazing only during the summer would cause them to decrease.

The "Ecological Site Productivity and Characteristic Plant Communities" table shows, for nearly all the soils, the ecological site; the potential annual production of vegetation in favorable, average, and unfavorable years; and the characteristic vegetation and composition of each site. Potential annual production is the amount of vegetation that can be expected to grow annually on well managed rangeland that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaf, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, average, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperature make growing conditions substantially better than average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture.

Yields are adjusted to a common percent of air-dry moisture content. The relationship of green weight to air dry weight varies according to such factors as exposure, amount of shade, recent rains, composition, and unseasonable dry periods.

Range management maintains the capacity of the rangeland to produce forage for livestock and game animals and to provide wildlife habitat, water, and watershed protection. The primary objective of good range management is to keep the rangeland in excellent or good condition. The main management concern is responding to important changes in the plant community of an ecological site.

Range condition is determined by comparing the present vegetation on a site with the potential native plant community. Four range condition classes are recognized. The site is in excellent condition if 76 to 100 percent of the present vegetation is the same kind as the potential native vegetation; in good condition if the percentage is 51 to 75; in fair condition if the percentage is 26 to 50; and in poor condition if the percentage is 25 or less. The potential production depends on the ecological site, the site condition, and the moisture available to plants during the growing season.

Measures that maintain or improve the site condition are needed on all of the rangeland in the county. They include proper stocking rates and rotation or deferred rotation grazing systems. These systems provide rest periods that maintain or improve the vigor of the key plants. Good range management also includes range seeding, fencing, and measures that provide water for livestock.

At the end of each description under the heading "Detailed Soil Map Units" and in the "Interpretive Groups" table, the soils are assigned to ecological sites. The paragraphs below describe the ecological sites:

Clayey ecological site. Climax plant cover is a mixture characteristic of the transition between the true and mixed prairie. Western wheatgrass and green needlegrass are the major constant dominants. Warm season grasses are present but are not abundant. An understory of short grasses is present. Forbs are woody plants and are not abundant on this site.

With overuse, the bluestems and green needlegrass decrease and are replaced by an increase in western wheatgrass. Continued overuse results in western wheatgrass being replaced by short grasses. This results in a less productive short grass site. The most productive grasses can be maintained by using proper stocking

rates along with a rotation grazing or a deferred grazing program that provides periodic rest periods during the key growing seasons of these plants. Grazing on these sites when wet will increase soil compaction.

Claypan ecological site. The climax plant cover is a mixture of mid, short, and tall grasses. Western wheatgrass and green needlegrass are the major codominants. Blue grama is the principal short grass. Forbs always occur, but shrubs are not significant on this site.

With continued overuse, the mid and tall grasses are replaced by short grasses. If overuse continues, there will be considerable bare ground, especially during dry cycles and many weeds during wet cycles. The most productive grasses can be maintained by using the proper stocking rates along with a rotation grazing or a deferred grazing program that provides periodic rest periods during the key growing seasons of these plants. Soil compaction is a potential problem during wet periods.

Closed Depression ecological site. The potential plant cover lacks the stability normally associated with climax because of the variable wetness or dryness of the site. The best vegetative cover attainable on this site is a mixture of mid and short grasses. Western wheatgrass is the constant dominant. Bluegrass and saltgrass are usually present in the understory. Sedges and forbs occur in appreciable amounts. Woody plants rarely occur.

Overgrazing and the resultant trampling aggravates the poor drainage of this site. Short grasses such as Kentucky bluegrass or saltgrass may become abundant. Sedges and rushes increase during wet periods but during a drought period, buffalograss becomes important. Invading weeds will also vary with the current wetness of the disturbed site. During wet periods smartweed is abundant; during dry periods weeds such as curlycup gumweed invade the site. The most productive grasses can be maintained by using the proper stocking rates along with timely deferments, particularly when the soil surface is saturated and the plants are subject to trampling damage. Limiting grazing on these sites when wet will limit soil compaction.

Limy Subirrigated ecological site. This site has the potential to produce a luxuriant stand of mid and tall grasses. Little bluestem is the major constant dominant, while big bluestem is an important subdominant. Tall grasses of secondary importance are switchgrass, Indiangrass, green needlegrass, and porcupinegrass. Mid grasses of secondary importance are sideoats grama, western wheatgrass, slender or bearded wheatgrass, and Canada wildrye. A minor amount of short grasses such as fowl bluegrass, blue grama, and sedge occur. Forbs such as goldenrods, asters, sageworts, American licorice, and western yarrow are common.

A management concern on this site is the high content of lime adversely affecting the availability of plant nutrients in maintaining the most productive grasses. With continued overuse the bluestems lose vigor and density. As this occurs, western wheatgrass and Kentucky bluegrass increase in abundance. After many years of overuse, saltgrass and unpalatable forbs may become dominant. The most productive grasses can be maintained by using the proper stocking rates along with a rotation grazing or a deferred grazing program that provides rest periods during the key growing season of the desirable plants.

Loamy ecological site. Climax plant cover is a mixture characteristic of the transition between the true and mixed prairie. Green needlegrass and western wheatgrass are the major constant dominants. Other cool season species are needleandthread, characteristic of mixed prairie, and porcupinegrass, of true prairie. Warm season grasses such as big and little bluestem, prairie dropseed, and sideoats grama are of considerable importance. Blue grama, Kentucky bluegrass, and sedges make up the understory. Forbs and shrubs, though generally not abundant, are an important part of the climax vegetation.

With overuse the bluestems, prairie dropseed, porcupinegrass, and green needlegrass decrease and are replaced by western wheatgrass and needleandthread. Continued overuse results in a cover of short grasses such as blue grama or Kentucky bluegrass. Lack of disturbance for long periods will result in a dominance of smooth brome and Kentucky bluegrass. This results in low forage production from this site. The most productive grasses can be improved or maintained by using the proper stocking rates along with timely deferment or a rotation grazing program that provides periodic rest periods during the key growing season of the desired plants.

Loamy Overflow ecological site. Climax plant cover is an excellent stand of tall and midgrasses. Big bluestem is the major constant dominant. Tall grasses of secondary importance are switchgrass, Indiangrass, Canada wildrye, porcupinegrass, and on sandy soils prairie sandreed. Little bluestem, green needlegrass, and western and/or bearded wheatgrasses are the principal midgrasses. A minor amount of short grasses such as bluegrasses, sideoats grama, and sedges occur. Forbs such as goldenrods, asters, sageworts, American licorice, and western yarrow are common. The shrubs, leadplant, snowberry, and rose usually occur throughout the site.

With continued overuse the tall climax grasses lose vigor and density and are replaced by mid and short grasses. With many years of overuse the plant community is dominated by Kentucky bluegrass. This results in low forage production. The most productive grasses can be improved or maintained by using the proper stocking rates along with a timely deferred or rotation grazing program that provides periodic rest periods during the key growing season of the desired plants.

Saline Lowland ecological site. Climax plant cover is made up of species that have a tolerance for salinity. Western wheatgrass is the major dominant. Nuttall alkaligrass may be important. Included in this site, because it is impractical to map them separately, are soils with a high water table. On these soils cordgrass is dominant. Saltgrass is the most abundant short grass. Sedges and forbs are present in small amounts but woody plants seldom occur.

With continued overuse the stand of climax grasses lose vigor and density. Saltgrass is then able to increase and it soon becomes the principal grass on the site. Because inland saltgrass is unpalatable and productivity is low, this site loses its capacity to produce quality forage for livestock grazing. The most productive grasses can be maintained by using the proper stocking rates along with rotation grazing or a deferred grazing program that provides periodic rest periods during the key growing seasons of these plants. Grazing this site when the soil is wet increases soil compaction.

Saline Subirrigated ecological site. This ecological site has the potential to produce a luxuriant stand of mid and tall grasses. Little bluestem is the major constant dominant. Big bluestem occurs in lesser amounts. Indiangrass, switchgrass, and prairie cordgrass are significant. Kentucky bluegrass, sedges, and saltgrass occur in the understory in small amounts. Forbs occur but only in small amounts. Shrubs are rarely present.

This is a very fragile plant community. With continued overuse the bluestems, Indiangrass, and switchgrass lose vigor and density. As this occurs western wheatgrass and Kentucky bluegrass increase in abundance. After many years of overuse inland saltgrass, foxtail barley, and unpalatable forbs will become abundant. Low forage production may be the result. The extent of the most productive grasses can be increased or maintained by proper stocking rates and by deferred grazing or a rotation grazing program, which provides rest periods during the key growing season of the desirable plants. The accumulation of salts may reduce the availability of plant nutrients and there is potential for denitrification.

Sandy ecological site. Climax plant cover is a mixture characteristic of the transition between the true and mixed prairie. Little bluestem, big or sand bluestem, and prairie sandreed are dominant. Needleandthread and porcupinegrass are important. Grama grasses and sedges occur as an understory. Forbs and shrubs are not abundant but are present in significant amounts.

With continued overuse the bluestems decrease and are replaced by prairie sandreed, needleandthread, western wheatgrass, and sideoats grama. If overuse continues for many years, these species give way to Kentucky bluegrass and blue grama. This results in low forage production from this site. The most productive grasses can be improved or maintained by using the proper stocking rates along with timely deferment or a rotation grazing program that provides periodic rest periods during the key growing seasons of these plants.

Shallow Gravel ecological site. Climax plant cover consists of a mixture of mid and short grasses. The midgrasses dominate the site. Needleandthread is the major constant dominant. Blue and hairy grama and threadleaf sedge are important short growing plants. Forbs such as blacksamson and shrubs such as leadplant are of considerable importance.

With continued overuse the mid grasses go out rapidly and the remaining cover is threadleaf sedge, short grasses, and forbs. If overuse continues, bare soil areas are evident and productivity of the site is greatly reduced. The most productive grasses can be maintained by using the proper stocking rates along with a rotation grazing or deferred grazing program that provides periodic rest during the key growing seasons of these plants. These soils have a potential for agrochemical leaching.

Shallow Marsh ecological site. This ecological site has the potential to produce a luxuriant stand of water-tolerant grasses and sedges. Rivergrass and slough sedge are the major dominants. American mannagrass and common spikesedge commonly occur in smaller amounts. Prairie cordgrass and reedgrasses occur in small amounts in some places. Forbs, such as smartweed and waterplantain, commonly occur. Shrubs and trees rarely occur. This ecological site often grades into a marsh which is not suited for grazing and is not an ecological site. Plants typical of marsh are bulrush and cattail.

With continued overuse the rivergrass and slough sedge decrease and are replaced by spikesedge and other grasslike plants. Because these plants are less palatable, the loss in productivity for haying and grazing is great. The extent of the most productive plants can be maintained by proper stocking rates and by a deferred grazing program, which provides rest periods during the key growing season of these plants.

Subirrigated ecological site. This ecological site has the potential to produce a luxuriant stand of tall grasses. Big bluestem is the major constant dominant. Switchgrass, Indiangrass, and little bluestem occur in lesser amounts. Kentucky bluegrass is usually present as a part of the understory. Sedges and forbs occur in appreciable amounts. Trees and shrubs are never abundant. Quite often this site is truly dominated by big bluestem.

With continued overuse the tall climax grasses such as big bluestem and switchgrass lose vigor and density. As this occurs, western wheatgrass, saltgrass, and Kentucky bluegrass increase. After many years of overuse Kentucky bluegrass, saltgrass, or foxtail barley, with an overstory of unpalatable weeds, will occupy this site. The most productive tall grasses can be maintained by using the proper stocking rates along with rotation grazing or a deferred grazing program that provides periodic rest periods during the key growing seasons of these plants.

Thin Claypan ecological site. The climax plant cover is a mixture of mid and short grasses. Western wheatgrass is the principal midgrass and blue grama, a short grass, is of major importance. Forbs are usually not significant. Pricklypear cactus occurs in small amounts.

With continued overuse the midgrasses are replaced by blue grama, buffalograss, and saltgrass. If overuse continues there will be considerable bare ground especially during dry cycles and weeds will be common during wet cycles. The western wheatgrass can be improved or maintained by using the proper stocking rates along with a timely deferment program that provides periodic rest periods during the key growing season of the plants desired.

Thin Loamy ecological site. Climax plant cover is a mixture characteristic of the transition between the true and mixed prairie. Little bluestem is the major dominant. Other important grasses are sideoats grama, green needlegrass, needleandthread, and plains muhly. Prairie sandreed may occur in places. Blue grama, sedges, and bluegrass make up the understory. Forbs, such as pasqueflower and blacksamson, and woody plants, such as leadplant and rose, are of common occurrence.

A management concern on this site is the high content of lime adversely affecting the availability of plant nutrients in maintaining the most productive grasses. With overuse the blustems and other tall grasses are replaced by an increase of needleandthread and sideoats grama. Continued overuse results in a major increase of short grasses. Because of the relative inaccessibility, remnants of the midgrasses are usually found on this site even after they have disappeared from other ecological sites in the same pasture. The most productive grasses can be improved or maintained by using the proper stocking rates along with timely deferment or a rotation grazing program that provides periodic rest periods during the key growing season of the desired plants.

Thin Upland ecological site. Climax plant cover is a mixture characteristic of the transition between the true and mixed prairie. Little bluestem is the major dominant. Other important grasses are sideoats grama, green needlegrass, needleandthread, and plains muhly. Prairie sandreed may occur in places. Blue grama, sedges, and bluegrass make up the understory. Forbs, such as pasqueflower and blacksamson, and woody plants, such as leadplant and rose, are of common occurrence.

A management concern on this site is the high content of lime adversely affecting the availability of plant nutrients in maintaining the most productive grasses. With overuse the bluestems and other tall grasses are replaced by an increase of needleandthread and sideoats grama. Continued overuse results in a major increase of short grasses. Because of the relative inaccessibility, remnants of the midgrasses are usually found on this site even after they have disappeared from other ecological sites in the same pasture. The most productive grasses can be improved or maintained by using the proper stocking rates along with timely deferment or a rotation grazing program that provides periodic rest periods during the key growing season of the desired plants.

Very Shallow ecological site. Climax plant cover consists of a mixture of mid and short grasses. Needleandthread is the major constant dominant. Blue and hairy grama and threadleaf sedges are the common short growing plants. Forbs and woody plants are of considerable importance.

With overuse this site rapidly deteriorates to a stand of blue grama and threadleaf sedge with a few unpalatable forbs. If overuse continues, the stand of short grasses may thin out and much of the soil is bare and exposed to erosion. A good productive grass cover can be maintained on this site by using the proper stocking rates along with timely deferment or a rotation grazing program that provides periodic rest periods during the key growing seasons of the desired plants.

Wet Land ecological site. The potential native vegetation on this site is grasses and sedges that can tolerate a seasonal high water table. These sites are often under water during the spring confining their use to summer and fall. This ecological site has the potential to produce a luxuriant stand of grasses that tolerate a high water table. Rivergrass is the dominant grass, while slough sedge is the dominant grasslike. Grasses and grass-likes of secondary importance are American

sloughgrass, mannagrass, prairie cordgrass, northern reedgrass, woolly sedge, bulrush, rush, and other grass-like. Shrubs and trees are rarely of consequence.

With continued overuse the stand of climax grasses loses vigor and density. As this occurs sedges, rushes, Kentucky bluegrass, saltgrass, and western wheatgrass increase or invade. All of these species are shorter and some are less palatable, so the forage production of the site is greatly reduced. The most productive grasses can be maintained by using proper stocking rates along with a rotation or deferred rotation grazing system that provides periodic rest periods during the key growing seasons of these plants. Grazing these sites when the soils are wet increases soil compaction.

Wet Meadow ecological site. This ecological site has the potential to produce a luxuriant stand of sedges and mid or tall grasses. Sedges, such as woolly sedge, are abundant. Prairie cordgrass, reed grasses, fowl bluegrass, and in places, reed canarygrass commonly occur in significant amounts. Western wheatgrass may occur on drier inclusions within the site. Forbs such as smartweed and false aster occur in small amounts. Shrubs and trees rarely occur.

With continued overuse the tall grasses and more palatable sedges decrease. As this occurs, less palatable sedges, spikesedge, and rushes increase and weedy grasses such as foxtail barley invade. Forage production of the site is then greatly reduced. The most productive plants can be maintained by using the proper stocking rates along with a grazing program that involves timely deferments to provide rest periods during the key growing season of these plants. Grazing these sites when the soils are wet increases soil compaction. These soils have a potential for denitrification.

Native Woodlands, Windbreaks, and Environmental Plantings

Gregory F. Yapp, forester, Natural Resources Conservation Service, helped prepare this section.

Native trees and shrubs grow on about 1,000 acres in Spink County. The soils that support trees and shrubs are not classified as woodland soils; they are grassland soils formed under a grassland influence. Isolated trees and shrubs exist in small clumps and larger groves. Bur oak, green ash, plains cottonwood, common chokecherry, American elm, American plum, western snowberry, box elder, false indigo, sandbar willow, and peachleaf willow are some of the more common species found. Green ash, the willows, plains cottonwood, American elm, American plum, common chokecherry, western snowberry, and boxelder are found on the LaDelle, Lamoure, and Ludden soils on the flood plains along the James River and Snake and Turtle Creeks. Peachleaf willow, plains cottonwood, and sandbar willow are common on the margins of natural lakes and wetlands throughout the county. Most of the wooded areas are used for recreation and wildlife habitat. Some areas are periodically grazed by livestock.

Windbreaks have been planted over the years to protect livestock, buildings, and yards from wind and snow. In addition, these plantings provide much needed winter cover for wildlife. Several rows of broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, help to keep snow on the fields, and provide food and cover for wildlife. This type of windbreak may consist of one or multiple rows of adapted tree and shrub species.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely

spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

The "Windbreaks and Environmental Plantings" table shows suitable tree and shrub species for planting as well as the 20-year height of the species on the various soil types in the county. The estimates in the table are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens. Complete weed control is essential to establish and maintain a good windbreak. Cultivation and the application of herbicides are effective methods of controlling weeds.

Grazing is extremely damaging to windbreaks because livestock compact the soil and remove the lower branches of the trees and shrubs. Removal of the lower branches reduces the effectiveness of the windbreaks.

At the end of each description under the heading "Detailed Soil Map Units" and in the "Interpretive Groups" table, the soils are assigned to conservation tree and shrub groups. A conservation tree and shrub group is a distinctive group of soils that supports trees and shrubs having similar growth and survival rates if weather conditions are normal and the windbreak is properly managed. The relationship between the soils and the growth of trees and shrubs was ascertained during this survey. Soil properties that affect moisture supply and plant nutrients have the greatest influence on the growth of trees and shrubs. Soil reaction, salt content, and a seasonal high water table also are important.

The paragraphs that follow describe the conservation tree and shrub groups:

Group 1. Soils in this group are deep (at least 40 inches to a restrictive layer). There is a beneficial growing season water table within three to five feet of the surface or they receive beneficial moisture from occasional flooding or runoff from adjacent land due to favorable landscape positions. These soils are well suited to all types of woody plantings and all climatically suited trees and shrubs have the potential to grow well. Competition from grasses and weeds is the principal concern in establishing and managing trees and shrubs. Occasionally, somewhat poorly drained soils may have excessive water for some species.

Group 1K. Soils in this group are deep (at least 40 inches to a restrictive layer). There is a beneficial growing season water table within three to five feet of the surface or they receive beneficial moisture from occasional flooding or runoff from adjacent land due to favorable landscape positions. The upper 12 inches of the soil profile have free carbonates ranging from 5 to 15 percent calcium carbonate equivalent. High surface soil pH, ranging from 7.9 to 8.4, will have an effect on the selection of species suitable for this subgroup. These soils are well suited to all types of woody plantings, and all climatically suited trees and shrubs have the potential to grow well. Competition from grasses and weeds is the principal concern in establishing and managing trees and shrubs. Occasionally, somewhat poorly drained soils may have excessive water for some species.

Group 1KK. Soils in this group are deep (at least 40 inches to a restrictive layer). There is a beneficial growing season water table within three to five feet of the surface or they receive beneficial moisture from occasional flooding or runoff from adjacent land due to favorable landscape positions. The upper 12 inches of the soil profile have free carbonates ranging from 15 to 40 percent calcium carbonate equivalent. High surface soil pH, ranging from 7.9 to 8.4, will have an effect on the selection of species suitable for this subgroup. These soils are suited to all types of woody plantings and all climatically suited trees and shrubs tolerant of high calcium carbonate concentrations have the potential to grow well. Competition from grasses and weeds is the principal concern in establishing and managing trees and shrubs. Occasionally, somewhat poorly drained soils may have excessive water for some species.

Group 2. Soils in this group are deep (at least 40 inches to a restrictive layer). A seasonal water table within 1.5 to 3 feet of the surface contributes to a poorly drained or somewhat poorly drained condition. It may be excessively wet during the spring or overflow periods. Wetness limits the selection of tree and shrub species suitable for planting on these soils and may reduce the growth rate. Competition from grasses and weeds is the principal concern in establishing and managing trees and shrubs. Spring planting may be delayed because of wet conditions.

Group 2K. Soils in this group are deep (at least 40 inches to a restrictive layer). A seasonal water table within 1.5 to 3 feet of the surface contributes to a poorly drained or somewhat poorly drained condition. It may be excessively wet during the spring or overflow periods. Wetness limits the selection of tree and shrub species suitable for planting on these soils and may reduce the growth rate. The upper 12 inches of the soil profile have free carbonates ranging from 5 to 15 percent calcium carbonate equivalent. High surface soil pH, ranging from 7.9 to 8.4, will have an effect on the selection of species suitable for this subgroup. Competition from grasses and weeds is the principal concern in establishing and managing trees and shrubs. Spring planting may be delayed because of wet conditions.

Group 2KK. Soils in this group are deep (at least 40 inches to a restrictive layer). A seasonal water table within 1.5 to 3 feet of the surface contributes to a poorly drained or somewhat poorly drained condition. It may be excessively wet during the spring or overflow periods. Wetness limits the selection of tree and shrub species suitable for planting on these soils and may reduce the growth rate. The upper 12 inches of the soil profile have free carbonates ranging from 15 to 40 percent calcium carbonate equivalent. High surface soil pH, ranging from 7.9 to 8.4, will have an effect on the selection of species suitable for this subgroup. Competition from grasses and weeds is the principal concern in establishing and managing trees and shrubs. Spring planting may be delayed because of wet conditions.

Group 3. Soils in this group are deep (at least 40 inches to a restrictive layer). The depth to a water table during the growing season is greater than five feet. Soils within this group are well drained, loamy textured soils with moderate and moderately slow permeability on uplands. These soils are well suited to all types of woody plantings. Except for those trees and shrubs that require abundant moisture, all climatically suited trees and shrubs have the potential to grow well. Competition from grasses and weeds is the principal concern in establishing and managing trees and shrubs on these soils. Water erosion is a concern on the gently sloping to moderately steep areas.

Group 4. Soil depth to a restrictive layer is at least 20 inches. Soils in this group have loamy surface textures with clayey subsoils. They have slow or very slow permeability and occur on uplands. These soils are fairly well suited to woody plantings. Most of the climatically suited trees and shrubs grow well; however, optimum growth is not possible because of the limited available water capacity and root development zone. High clay content and water availability have an effect on the selection of trees and shrub species suitable for these soils. Competition from grasses and weeds is the principal concern in establishing and managing trees and shrubs on these soils. Water erosion is a concern on the gently sloping to moderately steep areas.

Group 5. Soils in this group are deep (at least 40 inches to a restrictive layer), with loamy or sandy textured soils on uplands. This group typically includes soils that normally have adequate soil moisture (available water capacity ranges from 3.75 to 7.5 inches). These soils are well suited to woody plantings. All climatically suited trees and shrubs have the potential to grow well except those that require abundant moisture. Competition from grasses and weeds and abrasion from blowing are the principal concerns in establishing and managing trees and shrubs on these soils. These soils are subject to severe wind erosion.

Group 6D. Soil depth to a restrictive layer is between 20 and 40 inches. Soils in this group are well drained, mostly loamy textures, with a root restrictive layer such as bedrock or a cemented layer between 20 and 40 inches. They have low or moderate available water capacity. These soils are poorly suited to woody plantings. Plantings can be established, but optimum survival and growth should not be expected. Droughtiness will have an effect on the selection of tree and shrub species for use on these soils. Competition from grasses and weeds is the principal concern in establishing and managing trees and shrubs. Water erosion is a concern on gently sloping to moderately steep areas. Supplemental watering may be needed for establishment.

Group 6G. Soil depth to a restrictive layer is at least 20 inches. Soils in this group are well drained, mostly loamy textures, over sand and/or gravel that can severely restrict root growth. They have low or moderate available water capacity. These soils are poorly suited to woody plantings. Plantings can be established, but optimum survival and growth should not be expected. Droughtiness will have an effect on the selection of tree and shrub species for use on these soils. Competition from grasses and weeds is the principal concern in establishing and managing trees and shrubs. Water erosion is a concern on gently sloping to moderately steep areas. Supplemental watering may be needed for establishment.

Group 7. Soils in this group are deep, excessively to moderately well drained, sandy in texture, typically have low or very low available water capacity, and do not normally have adequate moisture. These soils are poorly suited to woody plantings. Coniferous trees are better suited than deciduous trees and shrubs. Optimum survival and growth should not be expected. Drought conditions and abrasion from soil blowing are the principal concerns in establishing and managing trees and shrubs on these soils. Specialized site preparation (due to sand that is subject to blow outs) and specialized planting methods (vegetation between the rows is normally left undisturbed) are needed to establish the trees and shrubs. Supplemental watering may be essential for successful establishment.

Group 8K. Soils in this group are calcareous at or near the surface. They do not receive beneficial moisture from run-in, flooding, or seasonal high water table. These soils are poorly suited to woody plantings. It is possible to establish plantings but these soils contain enough calcium carbonate at or near the surface to adversely affect the survival and growth of trees and shrubs. The upper 12 inches of the soil profile have free carbonates ranging from 15 to 40 percent calcium carbonate equivalent. High surface soil pH, ranging from 7.9 to 8.4, will have an effect on the selection of species suitable for this subgroup. High calcium content and competition from grasses and weeds are the principal concerns in establishing and managing trees and shrubs on these soils. Water erosion is a concern on gently sloping to moderately steep areas.

Group 9C. Soils in this group are affected by salinity and/or sodicity. The surface layer is clayey and depth to a restrictive layer is at least 20 inches. These soils are poorly suited to woody plantings. Concentrations of salt will severely affect the establishment, vigor, and growth of trees and shrubs on these soils.

Group 9L. Soils in this group are affected by salinity and/or sodicity. The surface layer is loamy and depth to a restrictive layer is at least 20 inches. These soils are poorly suited to woody plantings. Concentrations of salt will severely affect the establishment, vigor, and growth of trees and shrubs on these soils.

Group 9W. Soils in this group are affected by salinity and/or sodicity. There is a seasonal high water table. These soils are poorly suited to woody plantings. Concentrations of salt will severely affect the establishment, vigor, and growth of trees and shrubs on these soils.

Group 10. Soils in this group have one or more characteristics which severely limit planting, survival, or growth of trees and shrubs. The soils are shallow to bedrock, very shallow to gravel, very saline, very alkaline, steep, stony, or very wet. Soils in this group are usually not recommended for farmstead and feedlot windbreaks, field windbreaks, and plantings for recreation and wildlife. However, onsite investigations may reveal that tree and shrub plantings can be made with special treatments (hand planting, scalp planting, specialized site preparation, drainage, or other specialized treatments). The selection of species must be tailored to the soil conditions existing at each site.

Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from the local offices of the Natural Resources Conservation Service, the South Dakota Cooperative Extension Service, the South Dakota Agricultural Experiment Station at South Dakota State University, or from a commercial nursery.

Recreation

The soils of the survey area are rated in the “Camp Areas, Picnic Areas, and Playgrounds” and “Paths, Trails, and Golf Fairways” tables according to limitations that affect their suitability for recreation. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. **Not limited** indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. **Slightly limited** indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. **Somewhat limited** indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. **Very limited** indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings in the tables are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

The information in the tables can be supplemented by other information in this survey, for example, interpretations for building site development, construction materials, sanitary facilities, and water management.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some

vehicular traffic. The ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas.

The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Playgrounds require soils that are nearly level, are free of stones, and can withstand intensive foot traffic. The ratings are based on the soil properties that affect the ease of developing playgrounds and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of playgrounds. For good trafficability, the surface of the playgrounds should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Paths and trails for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

Off-road motorcycle trails require little or no site preparation. They are not covered with surfacing material or vegetation. Considerable compaction of the soil material is likely. The ratings are based on the soil properties that influence erodibility, trafficability, dustiness, and the ease of revegetation. These properties are stoniness, slope, depth to a water table, ponding, flooding, and texture of the surface layer.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer. The suitability of the soil for traps, tees, roughs, and greens is not considered in the ratings.

Wildlife Habitat

Connie Vicuna, biologist, Natural Resources Conservation Service, helped prepare this section.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

The most abundant wildlife species in Spink County are those that inhabit wetland areas and cultivated areas. These species provide the majority of wildlife-related recreational opportunities in the county. Wetland wildlife habitat in the area supports ducks, geese, herons, cormorants, pelicans, egrets, curlews, avocets, terns, and gulls and many smaller birds. Beaver, muskrat, and mink also are common in wetland areas. Cropland and associated areas provide important habitat elements for white-tailed deer, pheasants, and gray partridge. Common predators in the area include fox, badger, coyote, and raccoon. The populations of mule deer, antelope, and sharptail grouse are small and are limited to areas with expanses of grassland large enough to satisfy the needs of these species.

Although woody cover is not abundant in Spink County, it provides essential food and cover for many wildlife species. Woody habitat is available mostly along the James River, Turtle Creek, and Snake Creek. Farmstead and field windbreaks also provide woody habitat. The James River corridor is a major migration route through the prairie for a large number of bird species, including waterfowl, hawks, and songbirds. The James River and a number of reservoirs and small streams in Spink County support adequate quantities of fish for recreational purposes.

Because of similarities in topography, in the ability to support distinct plant communities, and in management needs, soil associations provide some indication of the actual and potential distribution and density of wildlife and their habitat. The soil associations in Spink County are described under the heading "General Soil Map Units."

The potential for habitat for white-tailed deer, pheasant, and gray partridge is good in all of the cropland areas in the county. The Ludden-Lamoure, Hand-Ethan-Bonilla, and Max-Arnegard-Zahl associations, along with individual hydric soils in other associations have potential for the development of waterfowl habitat.

Individual soils have different potentials for the development and maintenance of wildlife habitat elements. In the "Wildlife Habitat" table, the soils of Spink County are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated **good**, **fair**, **poor**, or **very poor**. A rating of **good** indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of **fair** indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of **poor** indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of **very poor** indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, ponding, and flooding. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, soybeans, sunflowers, and wheat.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, ponding, flooding, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are intermediate wheatgrass, tall wheatgrass, and alfalfa.

Native herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, ponding, and flooding. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are big bluestem, goldenrod, coneflowers, western wheatgrass, and green needlegrass.

Native deciduous trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are green ash, Russian olive, caragana, Rocky Mountain juniper, and eastern redcedar.

Planted woody plants include trees and shrubs that require cultivation before and during establishment, and eventually will provide fruit, buds, twigs, bark, and foliage. These habitats are important as food sources, reproductive cover, winter cover, and escape cover. Soil properties that affect the growth of trees and shrubs are depth of the root zone, available water capacity, soil reaction, wetness, slope, flooding, ponding, salinity, and soil moisture. Examples of these trees and shrubs are green ash, hackberry, caragana, plum, chokecherry, Rocky Mountain juniper, and eastern red cedar.

Native coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are cedar and juniper.

Native shrubs are bushy woody plants that produce fruit, buds, twigs, bark, and foliage. Soil properties and features that affect the growth of shrubs are depth of the root zone, available water capacity, salinity, and soil moisture. Examples of shrubs are sumac, willow, snowberry, chokecherry, and plum.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are cattails, smartweed, saltgrass, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

Information concerning the habitat elements needed to maintain and manage specific wildlife species can be obtained from the local office of the Natural Resources Conservation Service, the South Dakota Department of Game, Fish, and Parks, or South Dakota State University.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the "Glossary."

Building Site Development

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. The "Dwellings and Small Commercial Buildings" and "Roads and Streets, Shallow Excavations, and Lawns and Landscaping" tables show the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, shallow excavations, and lawns and landscaping.

The ratings in the tables are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. **Not limited** indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. **Slightly limited** indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. **Somewhat limited** indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. **Very limited** indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are

soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Sanitary Facilities

The “Sewage Disposal” and “Landfills” tables show the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, sanitary landfills, and daily cover for landfill. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. **Not limited** indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. **Slightly limited** indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. **Somewhat limited** indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. **Very limited** indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Soil permeability is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a permeability rate of more than 2 inches per hour are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

A trench sanitary landfill is an area where solid waste is placed in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil excavated at the site. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill. The ratings in the table are based on the soil properties that affect the risk of pollution, the ease of excavation, trafficability, and revegetation. These properties include permeability, depth to bedrock or a cemented pan, depth to a water table, ponding, slope, flooding, texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, onsite investigation may be needed.

Hard, nonrippable bedrock, creviced bedrock, or highly permeable strata in or directly below the proposed trench bottom can affect the ease of excavation and the hazard of ground-water pollution. Slope affects construction of the trenches and the movement of surface water around the landfill. It also affects the construction and performance of roads in areas of the landfill.

Soil texture and consistence affect the ease with which the trench is dug and the ease with which the soil can be used as daily or final cover. They determine the workability of the soil when dry and when wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact and are difficult to place as a uniformly thick cover over a layer of refuse.

The soil material used as the final cover for a trench landfill should be suitable for plants. It should not have excess sodium or salts and should not be too acid. The surface layer generally has the best workability, the highest content of organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

In an **area sanitary landfill**, solid waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site. A final cover of soil material at least 2 feet thick is placed over the completed landfill. The ratings in the table are based on the soil properties that affect trafficability and the risk of pollution. These properties include flooding, permeability, depth to a water table, ponding, slope, and depth to bedrock or a cemented pan.

Flooding is a serious problem because it can result in pollution in areas downstream from the landfill. If permeability is too rapid or if fractured bedrock, a fractured cemented pan, or the water table is close to the surface, the leachate can contaminate the water supply. Slope is a consideration because of the extra grading required to maintain roads in the steeper areas of the landfill. Also, leachate may flow along the surface of the soils in the steeper areas and cause difficult seepage problems.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste. The ratings in the table also apply to the final cover for a landfill. They are based on the soil properties that affect workability, the ease of digging, and the ease of moving and spreading the material over the refuse daily during wet and dry periods. These properties include soil texture, depth to a water table, ponding, rock fragments, slope, depth to bedrock or a cemented pan, reaction, and content of salts, sodium, or lime.

Loamy or silty soils that are free of large stones and excess gravel are the best cover for a landfill. Clayey soils may be sticky and difficult to spread; sandy soils are subject to wind erosion.

Slope affects the ease of excavation and of moving the cover material. Also, it can influence runoff, erosion, and reclamation of the borrow area.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. It should not have excess sodium, salts, or lime and should not be too acid.

Construction Materials

The “Source of Gravel and Sand” and “Source of Reclamation Material, Roadfill, and Topsoil” tables give information about the soils as potential sources of gravel, sand, reclamation material, roadfill, and topsoil. Normal compaction, minor processing, and other standard construction practices are assumed.

The soils are rated as a **probable** or **improbable** source of gravel and sand. A rating of **probable** means that the source material is likely to be in or below the soil. The numerical ratings in these columns indicate the degree of probability. The number 0.00 indicates that the soil is an improbable source. A number between 0.00 and 1.00 indicates the degree to which the soil is a probable source of gravel or sand.

The soils are rated **good**, **fair**, or **poor** as potential sources of reclamation material, roadfill, and topsoil. The features that limit the soils as sources of these materials are specified in the tables. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of these materials. The lower the number, the greater the limitation.

Gravel and sand are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In the “Source of Gravel and Sand” table, only the

probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the lowest layer of the soil contains sand or gravel, the soil is rated as a probable source regardless of thickness. The assumption is that the gravel or sand layer below the depth of observation exceeds the minimum thickness.

Reclamation material is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

The "Ponds and Embankments" table gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered **slight** if soil properties and site

features are generally favorable for the indicated use and limitations are minor and are easily overcome; **moderate** if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and **severe** if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

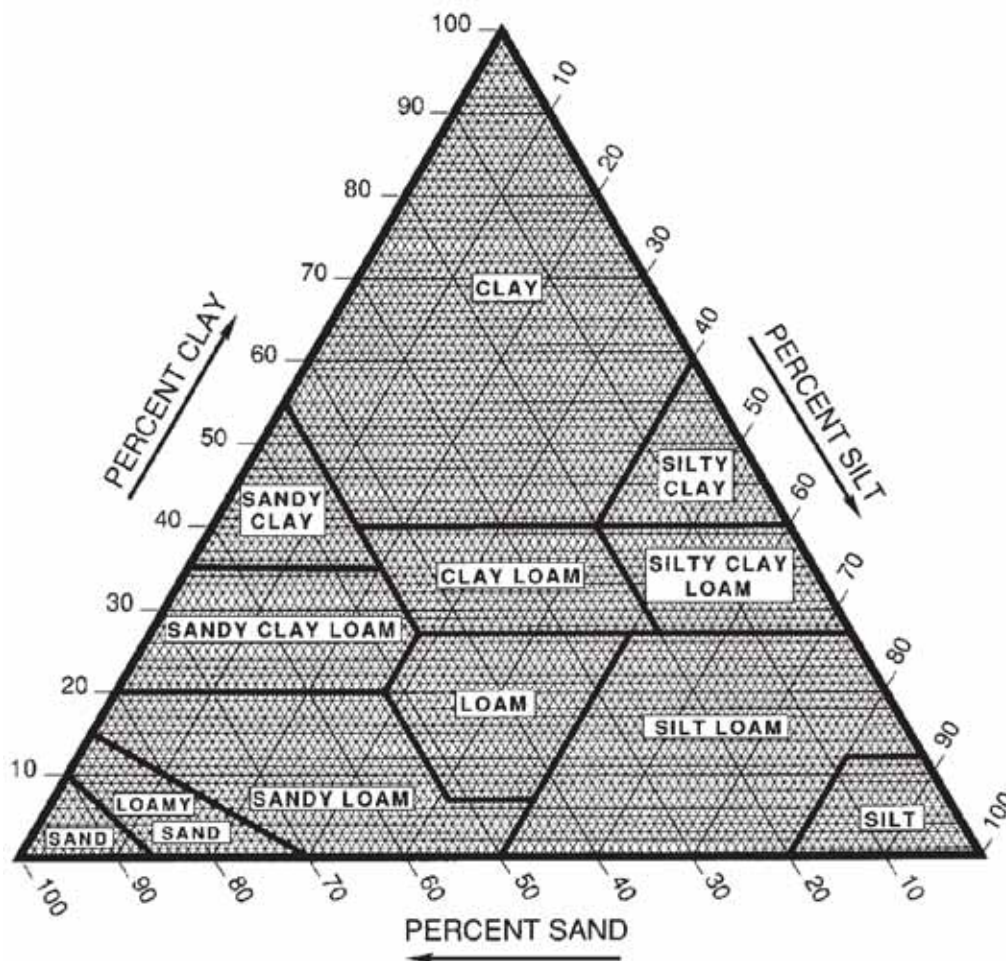


Figure 14. Percentages of clay, silt, and sand in the basic USDA soil textural classes.

Engineering Properties

The "Engineering Properties" table gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the county. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. Information on other properties of each layer is given for each soil series under the heading "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter (fig. 14). "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the "Glossary."

Classification of the soils is determined according to the Unified soil classification system (ASTM, 1993) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 1986).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and plasticity index (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical Properties

The "Physical Properties of the Soils" table shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In the table, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (oven-dry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3- or 1/10-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design and management of irrigation systems, development of nutrient and pesticide management plans, and design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated based on the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are low, a change of less than 3 percent; moderate, 3 to 6 percent; high, more than 6 percent; and very high, greater than 9 percent.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In the table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop residue and nutrients removed by harvest to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in the table as the **K** factor (**K_w** and **K_f**) and the **T** factor. Erosion factor **K** indicates the susceptibility of a soil to sheet and rill erosion by water. Factor **K** is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year.

The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of **K** range from 0.02 to 0.69. Other factors being equal, the higher the **K** value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor **K_w** indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor **K_f** indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor **T** is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are as follows:

1. Coarse sands, sands, fine sands, and very fine sands
2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, ash material, and sapric soil material
3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams
- 4L. Calcareous loams, silt loams, clay loams, and silty clay loams
4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay
5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material
6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay
7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material
8. Soils that are not subject to wind erosion because of coarse fragments on the surface or because of surface wetness

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Chemical Properties

The "Chemical Properties of the Soils" table shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Clay consists of mineral soil particles that are less than 0.002 millimeter in diameter. The estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material less than 2 millimeters in diameter.

Cation-exchange capacity is the total amount of extractable bases that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The high and low representative values range from 0 to 400. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a

high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Effective cation-exchange capacity refers to the sum of extractable bases plus aluminum expressed in terms of milliequivalents per 100 grams of soil. It is determined for soils that have pH of less than 5.5.

Soil reaction is a measure of acidity or alkalinity (see Reaction, soil). The pH of each soil horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

Gypsum is expressed as a percent, by weight, of hydrated calcium sulfates in the fraction of the soil less than 20 millimeters in size. Gypsum is partially soluble in water. Soils that have a high content of gypsum may collapse if the gypsum is removed by percolating water.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Very slightly saline 2 to < 4 mmhos/cm, slightly saline 4 to < 8 mmhos/cm, moderately saline 8 to < 16 mmhos/cm, and strongly saline > 16 mmhos/cm. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production (plant available water holding capacity and plant nutrient availability), the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Sodium adsorption ratio (SAR) is a measure of the amount of sodium (Na^+) relative to calcium (Ca^{++}) and magnesium (Mg^{++}) in the water extract from saturated soil paste. It is the ratio of the Na^+ concentration divided by the square root of one-half of the Ca^{++} plus Mg^{++} concentration. Soils that have SAR values of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced permeability and aeration, reduced plant growth, reduced nutrient availability and a general degradation of soil structure.

Water Features

The "Water Features" table gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well

drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

The **months** in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. The table indicates, by month, depth to the top (upper limit) and base (lower limit) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table in this report.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The table indicates surface water depth and the duration and frequency of ponding. Duration is expressed as **very brief** if less than 2 days, **brief** if 2 to 7 days, **long** if 7 to 30 days, and **very long** if more than 30 days. Frequency is expressed as **none**, **rare**, **occasional**, and **frequent**. **None** means that ponding is not probable; **rare** that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); **occasional** that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and **frequent** that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and **frequency** are estimated. Duration is expressed as **extremely brief** if 0.1 hour to 4 hours, **very brief** if 4 hours to 2 days, **brief** if 2 to 7 days, **long** if 7 to 30 days, and **very long** if more than 30 days. Frequency is expressed as **none**, **very rare**, **rare**, **occasional**, **frequent**, and **very frequent**. **None** means that flooding is not probable; **very rare** that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); **rare** that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); **occasional** that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); **frequent** that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and **very frequent** that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered is local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Soil Features

The "Soil Features" table gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A **restrictive layer** is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, natric horizons, some argillic horizons, frozen layers, and in some instances, glacial outwash without sufficient fines. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. **Depth to top** is the vertical distance from the soil surface to the upper boundary of the restrictive layer. The rating values are: very shallow < 10 inches, shallow 10 to 20 inches, moderately deep 20 to 40 inches, deep 40 to 60 inches, and very deep > 60 inches.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer. For **uncoated steel**, the risk of corrosion, expressed as low, moderate, or high, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract. For **concrete**, the risk of corrosion also is expressed as low, moderate, or high. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (USDA, 1999). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. The "Classification of the Soils" table shows the classification of the soils in the county. The categories are defined in the following paragraphs.

ORDER. Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in sol. An example is Mollisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Ustoll (Ust, meaning burnt as implying dryness, plus oll, from Mollisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haplustolls (Hapl, meaning minimal horizonation, plus ustoll, the suborder of the Mollisols that has a dryer temperature regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective Typic identifies the subgroup that typifies the great group. An example is Typic Haplustolls.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle size, mineral content, soil temperature regime, soil depth, and reaction. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, superactive, mesic Typic Haplustolls.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. An example is the Hand series: fine-loamy, mixed, superactive, mesic Typic Haplustolls.

Soil Series and Their Morphology

In this section, each soil series recognized in the county is described. The descriptions are arranged in alphabetic order. Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the county is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (USDA, 1993). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (USDA, 1999). Unless otherwise indicated, colors in the descriptions are for dry soil, although redox concentrations, redox depletions, mottles (used for color patterns not related to soil wetness), organic coats, and manganese stains are described under moist conditions. Following the pedon description is the range of important characteristics of the soils in the series.

All pedons were described to 80 inches, except Dovray, Southam, and Worthing which are located in adjoining counties.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Aastad Series

Depth to restrictive feature: None
Drainage class: Moderately well drained
Permeability: Moderately slow
Landform: Till plains
Parent material: Loamy glacial till
Slope: 0 to 2 percent

Typical Pedon

Aastad loam, in an area of Forman-Buse-Aastad loams, 1 to 6 percent slopes, 1,800 feet east and 2,575 feet north of the southwest corner of sec. 2, T. 120 N., R. 60 W.; USGS Conde, SD topographic quadrangle; lat. 45 degrees 13 minutes 57 seconds N. and long. 98 degrees 1 minute 36 seconds W.

Ap—0 to 8 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak fine subangular blocky structure parting to weak fine granular; slightly hard, friable; common very fine and fine roots throughout; few very fine tubular pores; slightly acid; abrupt smooth boundary.

A—8 to 14 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine tubular pores; slightly acid; clear smooth boundary.

Bw1—14 to 21 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to weak medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine and fine tubular pores; neutral; clear smooth boundary.

Bw2—21 to 29 inches; light olive brown (2.5Y 5/3) clay loam, dark olive brown (2.5Y 3/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm, slightly sticky and slightly plastic; few very fine roots throughout; few very fine tubular pores; few fine prominent dark yellowish brown (10YR 4/4) redox concentrations; neutral; clear wavy boundary.

- Bk—29 to 43 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak medium prismatic structure parting to weak fine subangular blocky; hard, firm, slightly sticky and slightly plastic; few very fine roots throughout; few very fine tubular pores; 20 percent calcium carbonate equivalent; few iron stains; common fine and medium soft masses of carbonate; few fine prominent dark yellowish brown (10YR 4/4) redox concentrations and few fine prominent gray (10YR 5/1) redox depletions; 2 percent pebbles; strongly effervescent; slightly alkaline; gradual wavy boundary.
- Bck—43 to 57 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak medium subangular blocky structure; hard, firm, sticky and plastic; few very fine tubular pores; 14 percent calcium carbonate equivalent; few iron stains; few fine soft masses of carbonate; common fine prominent dark yellowish brown (10YR 4/4) redox concentrations and few fine prominent gray (10YR 5/1) redox depletions; 2 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C—57 to 80 inches; light yellowish brown (2.5Y 6/3) clay loam, olive brown (2.5Y 4/3) moist; massive; hard, firm, sticky and plastic; few very fine tubular pores; 13 percent calcium carbonate equivalent; few iron stains; many fine and medium prominent dark yellowish brown (10YR 4/4) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; 2 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 to 24 inches

Depth to carbonates: 18 to 40 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 40 inches

Remarks: Some pedons lack a Bck horizon.

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1

Texture - loam but is clay loam in some pedons

Bw horizon:

Hue - 2.5Y or 10YR; value - 3 to 5 (2 to 4 moist); and chroma - 2 to 4

Texture - clay loam

Bk horizon:

Hue - 2.5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - clay loam

C horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - clay loam or loam

Aberdeen Series

Depth to restrictive feature: None

Drainage class: Moderately well drained

Permeability: Slow

Landform: Lake plains

Parent material: Clayey glaciolacustrine sediments over loamy glacial till

Slope: 0 to 2 percent

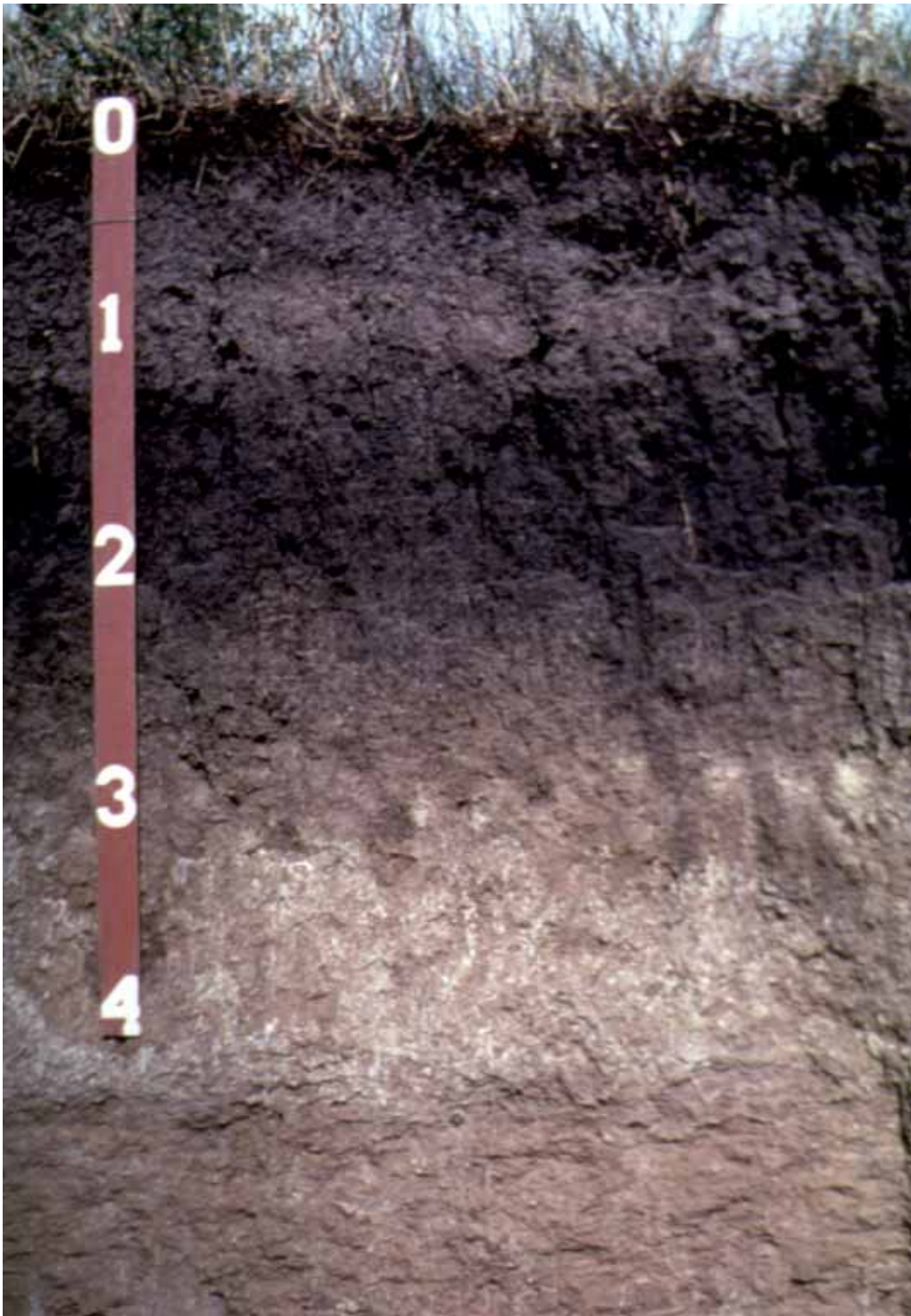


Figure 15. Profile of Aberdeen silt loam. This soil is dark to a depth of about 34 inches. Depth is marked in feet.

Typical Pedon

Aberdeen silt loam (fig. 15), in an area of Nahon-Aberdeen-Exline silt loams, 0 to 2 percent slopes, 600 feet west and 2,450 feet north of the southeast corner of sec. 11,

T. 117 N., R. 64 W.; USGS Ashton, SD topographic quadrangle; lat. 45 degrees 57 minutes 43 seconds N. and long. 98 degrees 29 minutes 18 seconds W.

- A—0 to 8 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; weak fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots throughout; common very fine tubular pores; neutral; clear smooth boundary.
- BE—8 to 13 inches; gray (10YR 5/1) silty clay loam, very dark gray (10YR 3/1) moist; weak fine and medium subangular blocky structure parting to weak thin platy; hard, friable, slightly sticky and slightly plastic; common very fine and fine roots throughout; common very fine and fine tubular pores; gray (10YR 6/1) coats on horizontal faces of peds; neutral; clear smooth boundary.
- Btn—13 to 23 inches; dark gray (10YR 4/1) silty clay, very dark gray (10YR 3/1) moist; moderate medium prismatic structure parting to moderate fine and medium angular blocky; very hard, very firm, sticky and plastic; common very fine roots between peds; few very fine tubular pores; clay films on vertical faces of peds; slightly alkaline; clear smooth boundary.
- Bkz1—23 to 31 inches; grayish brown (2.5Y 5/2) silty clay loam, very dark grayish brown (2.5Y 3/2) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine tubular pores; 10 percent calcium carbonate equivalent; common fine salt masses and few fine gypsum crystals; strongly effervescent; moderately alkaline; clear wavy boundary.
- Bkz2—31 to 39 inches; light brownish gray (2.5Y 6/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine tubular pores; 14 percent calcium carbonate equivalent; common fine salt masses and few fine gypsum crystals; strongly effervescent; moderately alkaline; clear smooth boundary.
- C1—39 to 69 inches; pale yellow (2.5Y 7/3) silty clay loam, light olive brown (2.5Y 5/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine tubular pores; varved with very fine sand to clay; 11 percent calcium carbonate equivalent; common fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C2—69 to 80 inches; pale yellow (2.5Y 7/3) silty clay loam, light olive brown (2.5Y 5/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine tubular pores; varved with very fine sand to clay; 10 percent calcium carbonate equivalent; common medium and coarse prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine and medium prominent gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 to 32 inches

Depth to carbonates: 16 to 40 inches

Depth to contrasting parent material: Greater than 40 inches over glacial till

Depth to gypsum and other visible salts other than carbonates: Greater than 22 inches

Remarks: Some pedons lack a BCK horizon.

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1
Texture - silt loam or silty clay loam

BE horizon:

Hue - 10YR; value - 4 or 5 (3 or 4 moist); and chroma - 1 or 2
Texture - silty clay loam or silt loam

Btn horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 to 4 moist); and chroma - 1 to 3
Texture - silty clay, silty clay loam, or clay

Bkz horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (3 to 5 moist); and chroma - 1 to 4
Texture - silty clay loam, silty clay, or silt loam

C horizon:

Hue - 2.5Y or 5Y; value - 5 to 8 (4 to 6 moist); and chroma - 2 to 4
Texture - silt loam or silty clay loam and typically is varved with very fine sand to clay in the lower part but is varved very fine sand to clay in some pedons

2C horizon:

Hue - 2.5Y or 5Y; value - 5 to 8 (4 to 6 moist); and chroma - 2 to 4
Texture - clay loam or loam

Arnegard Series

Depth to restrictive feature: None

Drainage class: Well and moderately well drained

Permeability: Moderate

Landform: Till plains

Parent material: Loamy glacial till

Slope: 0 to 6 percent

Typical Pedon

Arnegard loam, in an area of Max-Arnegard-Zahl loams, 1 to 6 percent slopes, 960 feet north and 100 feet east of the southwest corner of sec. 28, T. 118 N., R. 65 W.; USGS Northville SW, SD topographic quadrangle; lat. 45 degrees 0 minutes 10 seconds N. and long. 98 degrees 40 minutes 28 seconds W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak fine and medium subangular blocky structure parting to weak medium granular; slightly hard, friable; common very fine roots throughout; common very fine and fine tubular pores; neutral; abrupt smooth boundary.

Bw1—8 to 14 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; slightly hard, friable; common very fine roots throughout; few very fine and fine tubular pores; neutral; clear smooth boundary.

Bw2—14 to 19 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; slightly hard, friable; few very fine roots throughout; common very fine and fine tubular pores; neutral; clear smooth boundary.

Bw3—19 to 25 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; slightly hard, friable; few very fine roots throughout; few very fine tubular pores; 1 percent pebbles; neutral; clear smooth boundary.

- Bk**—25 to 40 inches; pale yellow (2.5Y 7/3) loam, light olive brown (2.5Y 5/3) moist; weak fine and medium subangular blocky structure; slightly hard, friable; few very fine roots throughout; few very fine tubular pores; 18 percent calcium carbonate equivalent; common fine and medium soft masses of carbonate; few fine distinct yellowish brown (10YR 5/6) redox concentrations; 1 percent pebbles; strongly effervescent; moderately alkaline; clear wavy boundary.
- C1**—40 to 62 inches; light yellowish brown (2.5Y 6/3) loam, olive brown (2.5Y 4/3) moist; massive; slightly hard, friable; few very fine tubular pores; 12 percent calcium carbonate equivalent; common fine and medium soft masses of iron-manganese; few fine prominent yellowish brown (10YR 5/6) redox concentrations and few fine distinct gray (10YR 5/1) redox depletions; 3 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C2**—62 to 80 inches; light yellowish brown (2.5Y 6/3) loam, olive brown (2.5Y 4/3) moist; massive; slightly hard, friable; few very fine tubular pores; 9 percent calcium carbonate equivalent; common fine and medium soft masses of iron-manganese; common fine and medium prominent yellowish brown (10YR 5/6) redox concentrations and few fine distinct gray (10YR 5/1) redox depletions; 3 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 to 40 inches

Depth to carbonates: 25 to 60 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 2

Texture - loam

Bw horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 to 4 moist); and chroma - 2 to 4

Texture - loam or clay loam

Bk horizon:

Hue - 2.5Y or 10YR; value - 4 to 7 (3 to 5 moist); and chroma - 2 to 4

Texture - loam or clay loam

C horizon:

Hue - 2.5Y or 10YR; value - 5 to 7 (4 or 5 moist); and chroma - 2 to 4

Texture - loam or clay loam

Barnes Series

Depth to restrictive feature: None

Drainage class: Well drained

Permeability: Moderately slow

Landform: Moraines

Parent material: Loamy glacial till

Slope: 9 to 25 percent

Typical Pedon

Barnes loam, in an area of Buse-Barnes loams, 9 to 20 percent slopes, 1,000 feet south and 700 feet west of the northeast corner of sec. 13, T. 115 N., R. 61 W.; USGS Doland SE, SD topographic quadrangle; lat. 44 degrees 46 minutes 28 seconds N. and long. 98 degrees 6 minutes 8 seconds W.

- A—0 to 7 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak fine subangular blocky structure parting to weak fine granular; slightly hard, friable; many very fine and fine roots throughout; few very fine tubular pores; neutral; clear smooth boundary.
- Bw—7 to 15 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable; common very fine roots throughout; few very fine tubular pores; neutral; gradual wavy boundary.
- Bk—15 to 30 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; weak fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; few very fine tubular pores; 25 percent calcium carbonate equivalent; common fine and medium soft masses of carbonate; 2 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
- BCK—30 to 38 inches; light yellowish brown (2.5Y 6/3) loam, olive brown (2.5Y 4/3) moist; weak medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; 28 percent calcium carbonate equivalent; common fine soft masses of carbonate; 2 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C1—38 to 67 inches; light yellowish brown (2.5Y 6/3) clay loam, olive brown (2.5Y 4/3) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; 18 percent calcium carbonate equivalent; few fine soft masses of iron-manganese; few fine prominent dark yellowish brown (10YR 4/4) relict redox features; 2 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C2—67 to 80 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; 20 percent calcium carbonate equivalent; few iron stains; common fine prominent dark yellowish brown (10YR 4/4) redox concentrations and common fine prominent dark gray (10YR 4/1) redox depletions; 2 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches

Depth to carbonates: 10 to 20 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

Remarks: Some pedons lack a BCK horizon.

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1 or 2

Texture - loam but is clay loam in some pedons

Bw horizon:

Hue - 10YR or 2.5Y; value - 3 to 6 (2 to 5 moist); and chroma - 2 to 4

Texture - loam or clay loam

Bk horizon:

Hue - 10YR or 2.5Y; value - 5 to 8 (4 to 6 moist); and chroma - 2 to 4

Texture - loam or clay loam

C horizon:

Hue - 10YR or 2.5Y; value - 4 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - loam or clay loam

Beadle Series

Depth to restrictive feature: None

Drainage class: Well drained

Permeability: Slow

Landform: Till plains

Parent material: Clayey glacial till

Slope: 0 to 9 percent

Typical Pedon

Beadle loam, in an area of Beadle-Stickney complex, 0 to 2 percent slopes, 1,950 feet south and 480 feet east of the northwest corner of sec. 8, T. 114 N., R. 61 W.; USGS Lake Byron NW, SD topographic quadrangle; lat. 44 degrees 41 minutes 58 seconds N. and long. 98 degrees 11 minutes 52 seconds W.

Ap—0 to 7 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak fine and medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; few very fine tubular pores; neutral; abrupt smooth boundary.

Bt—7 to 16 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm, sticky and plastic; common very fine roots throughout; few very fine tubular pores; clay films on vertical faces of peds; slightly alkaline; clear smooth boundary.

Bk1—16 to 26 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; hard, firm, sticky and plastic; few very fine roots throughout; common very fine tubular pores; 16 percent calcium carbonate equivalent; common medium and coarse soft masses of carbonate; strongly effervescent; 2 percent pebbles; moderately alkaline; clear smooth boundary.

Bk2—26 to 35 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak fine and medium subangular blocky structure; hard, firm, sticky and plastic; few very fine roots throughout; common very fine tubular pores; 18 percent calcium carbonate equivalent; common fine and medium soft masses of carbonate; strongly effervescent; 2 percent pebbles; moderately alkaline; gradual wavy boundary.

C1—35 to 65 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, firm, sticky and plastic; few very fine tubular pores; 11 percent calcium carbonate equivalent; few manganese or iron-manganese stains; few fine soft masses of carbonate; few fine prominent dark yellowish brown (10YR 4/6) and few fine prominent gray (10YR 5/1) relict redox features; strongly effervescent; 5 percent pebbles; moderately alkaline; gradual wavy boundary.

C2—65 to 80 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, firm, sticky and plastic; few very fine tubular pores; 13 percent calcium carbonate equivalent; common manganese or iron-manganese stains; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; 5 percent pebbles; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 8 to 20 inches

Depth to carbonates: 12 to 25 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 40 inches

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1 or 2

Texture - loam but is silt loam or clay loam in some pedons

Bt horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (3 or 4 moist); and chroma - 1 to 3

Texture - clay or clay loam

Bk horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 or 3

Texture - clay loam or clay

C horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - clay loam or clay

Bearden Series

Depth to restrictive feature: None

Drainage class: Somewhat poorly drained

Permeability: Moderately slow in the solum and moderate to slow in the underlying material

Landform: Lake plains

Parent material: Silty glaciolacustrine sediments

Slope: 0 to 2 percent

Typical Pedon

Bearden silt loam, 0 to 2 percent slopes, 1,500 feet north and 900 feet west of the southeast corner of sec. 8, T. 120 N., R. 64 W.; USGS Northville, SD topographic quadrangle; lat. 45 degrees 13 minutes 16 seconds N. and long. 98 degrees 33 minutes 31 seconds W.

Ap—0 to 7 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; weak fine granular structure; soft, very friable; common very fine and fine roots throughout; few very fine tubular pores; 8 percent calcium carbonate equivalent; slightly effervescent; moderately alkaline; abrupt smooth boundary.

ABk—7 to 12 inches; gray (10YR 5/1) and gray (10YR 6/1) silt loam, very dark gray (10YR 3/1) and dark gray (10YR 4/1) moist; weak fine and medium subangular blocky structure; slightly hard, friable; common very fine and fine roots throughout; few very fine tubular pores; 15 percent calcium carbonate equivalent; strongly effervescent; moderately alkaline; clear wavy boundary.

Bk1—12 to 16 inches; light gray (2.5Y 7/2) silt loam, grayish brown (2.5Y 5/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable; few very fine roots throughout; common very fine and fine tubular pores; 32 percent calcium carbonate equivalent; few fine salt masses; violently effervescent; moderately alkaline; clear wavy boundary.

Bk2—16 to 24 inches; pale yellow (2.5Y 7/4) silt loam, light olive brown (2.5Y 5/4) moist; weak fine and medium subangular blocky structure; slightly hard, friable; few very fine roots throughout; common very fine and fine tubular pores; 22 percent calcium carbonate equivalent; few fine salt masses; few fine distinct dark yellowish brown (10YR 4/6) redox concentrations; violently effervescent; moderately alkaline; clear wavy boundary.

- Bk3—24 to 38 inches; pale yellow (2.5Y 7/4) silt loam, light olive brown (2.5Y 5/4) moist; weak fine and medium subangular blocky structure; slightly hard, friable; few very fine roots throughout; few very fine tubular pores; 15 percent calcium carbonate equivalent; few fine salt masses; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline; clear wavy boundary.
- C1—38 to 55 inches; pale yellow (2.5Y 7/4) silt loam, light olive brown (2.5Y 5/4) moist; massive; slightly hard, friable; few very fine tubular pores; varved with very fine sand to clay; 8 percent calcium carbonate equivalent; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline; clear wavy boundary.
- C2—55 to 70 inches; pale yellow (2.5Y 7/4) silt loam, light olive brown (2.5Y 5/4) moist; massive; slightly hard, friable; few very fine tubular pores; varved with very fine sand to clay; 7 percent calcium carbonate equivalent; common fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine and medium prominent gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline; clear wavy boundary.
- C3—70 to 80 inches; pale yellow (2.5Y 8/4) silt loam, light yellowish brown (2.5Y 6/4) moist; massive; soft, very friable; few very fine tubular pores; varved with very fine sand to clay; 7 percent calcium carbonate equivalent; common fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine and medium prominent gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 20 inches

Depth to carbonates: At the surface

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 10 inches

A horizon:

Hue - 10YR, 2.5Y, 5Y, or neutral; value - 3 to 5 (2 or 3 moist); and chroma - 0 or 1
Texture - silt loam but is silty clay loam in some pedons

Bk horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 5 to 7 (3 to 7 moist); and chroma - 1 to 4
Texture - silt loam or silty clay loam

C horizon:

Hue - 2.5Y, 5Y, or neutral; value - 5 to 8 (4 to 7 moist); and chroma - 0 to 4
Texture - silt loam or silty clay loam and typically is varved with very fine sand to clay in the lower part

Beotia Series

Depth to restrictive feature: None

Drainage class: Well and moderately well drained

Permeability: Moderate in the solum and moderate to slow in the underlying material

Landform: Lake plains

Parent material: Silty glaciolacustrine sediments over loamy glacial till

Slope: 0 to 2 percent

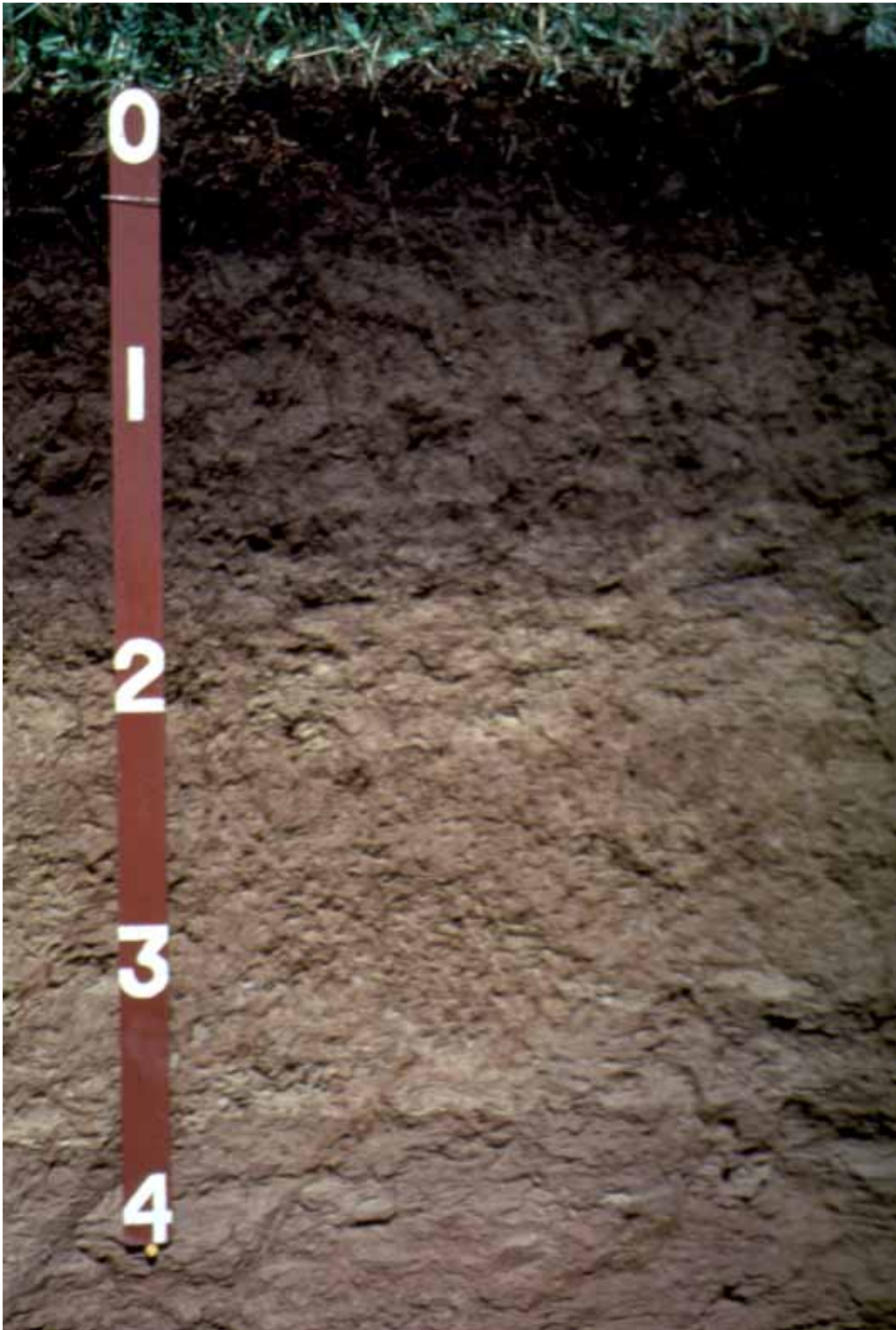


Figure 16. Profile of Beotia silt loam. This soil is dark to a depth of about 22 inches and calcium carbonate is below this depth. Depth is marked in feet.

Typical Pedon

Beotia silt loam (fig. 16), in an area of Great Bend-Beotia silt loams, 0 to 2 percent slopes, 600 feet west and 1,150 feet north of the southeast corner of sec. 19,

T. 117 N., R. 62 W.; USGS Frankfort, SD topographic quadrangle; lat. 44 degrees 55 minutes 38 seconds N. and long. 98 degrees 19 minutes 51 seconds W.

Ap—0 to 9 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; moderate medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; few very fine and fine tubular pores; slightly acid; abrupt smooth boundary.

Bw1—9 to 17 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark gray (10YR 3/1) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine and fine tubular pores; neutral; clear smooth boundary.

Bw2—17 to 21 inches; light olive brown (2.5Y 5/3) silt loam, dark olive brown (2.5Y 3/3) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine and fine tubular pores; neutral; clear smooth boundary.

Bk1—21 to 30 inches; pale yellow (2.5Y 7/4) silt loam, light olive brown (2.5Y 5/4) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine and fine tubular pores; 21 percent calcium carbonate equivalent; strongly effervescent; moderately alkaline; clear wavy boundary.

Bk2—30 to 39 inches; pale yellow (2.5Y 7/4) silt loam, light olive brown (2.5Y 5/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine and fine tubular pores; 21 percent calcium carbonate equivalent; strongly effervescent; moderately alkaline; clear wavy boundary.

C—39 to 80 inches; pale yellow (2.5Y 8/4) silty clay loam, light olive brown (2.5Y 5/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine tubular pores; varved with very fine sand to clay; 17 percent calcium carbonate equivalent; few fine dark yellowish brown (10YR 4/6) redox concentrations and few fine gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 to 30 inches

Depth to carbonates: 16 to 30 inches

Depth to contrasting parent material: Greater than 40 inches over glacial till

Depth to gypsum and other visible salts other than carbonates: Greater than 30 inches

Remarks: Some pedons have a loam or clay loam 2C horizon.

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1

Texture - silt loam

Bw horizon:

Hue - 10YR or 2.5Y; value - 4 to 6 (2 to 4 moist); and chroma - 1 to 3

Texture - silt loam or silty clay loam

Bk horizon:

Hue - 10YR or 2.5Y; value - 5 to 8 (4 to 6 moist); and chroma - 2 to 4

Texture - silt loam or silty clay loam

C horizon:

Hue - 2.5Y; value - 6 to 8 (4 to 6 moist); and chroma - 2 to 4

Texture - silt loam or silty clay loam and typically is varved with very fine sand to clay in the lower part

2C horizon:

Hue - 2.5Y; value - 6 to 8 (4 to 6 moist); and chroma - 2 to 4
 Texture - clay loam or loam

Betts Series

Depth to restrictive feature: None

Drainage class: Well drained

Permeability: Moderately slow

Landform: Moraines

Parent material: Loamy glacial till

Slope: 25 to 40 percent

Typical Pedon

Betts loam, in an area of Ethan-Betts loams, 15 to 40 percent slopes, 140 feet north and 445 feet west of the southeast corner of sec. 18, T. 115 N., R. 65 W.; USGS Redfield, SD topographic quadrangle; lat. 44 degrees 45 minutes 55 seconds N. and long. 98 degrees 41 minutes 17 seconds W.

- A—0 to 3 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; slightly hard, friable; many very fine and fine roots throughout; few very fine tubular pores; 8 percent calcium carbonate equivalent; strongly effervescent; slightly alkaline; clear smooth boundary.
- Bk1—3 to 10 inches; light gray (2.5Y 7/2) loam, light olive brown (2.5Y 5/3) moist; weak fine and medium subangular blocky structure; slightly hard, friable; common very fine and fine roots throughout; common very fine tubular pores; 19 percent calcium carbonate equivalent; common fine and medium soft masses of carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.
- Bk2—10 to 29 inches; pale yellow (2.5Y 7/3) loam, light olive brown (2.5Y 5/3) moist; weak fine and medium subangular blocky structure; slightly hard, friable; few very fine roots throughout; common very fine tubular pores; 13 percent calcium carbonate equivalent; common fine soft masses of carbonate; strongly effervescent; 3 percent pebbles; moderately alkaline; gradual wavy boundary.
- C1—29 to 43 inches; pale yellow (2.5Y 7/3) loam, light olive brown (2.5Y 5/3) moist; massive; slightly hard, friable; few very fine tubular pores; 11 percent calcium carbonate equivalent; few fine soft masses of carbonate; strongly effervescent; 3 percent pebbles; moderately alkaline; gradual wavy boundary.
- C2—43 to 80 inches; light yellowish brown (2.5Y 6/3) loam, olive brown (2.5Y 4/3) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; 10 percent calcium carbonate equivalent; few fine prominent dark yellowish brown (10YR 4/4) relict redox features; 3 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 0 to 3 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

Remarks: Some pedons have a Bw horizon.

A horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 1 or 2
Texture - loam but is clay loam in some pedons

Bk horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4
Texture - clay loam or loam

C horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4
Texture - clay loam or loam

Blendon Series

Depth to restrictive feature: None

Drainage class: Well drained

Permeability: Moderately rapid

Landform: Outwash plains

Parent material: Loamy glaciofluvial sediments

Slope: 0 to 6 percent

Typical Pedon

Blendon fine sandy loam, in an area of Henkin-Blendon fine sandy loams, 2 to 6 percent slopes, 230 feet north and 1,700 feet east of the southwest corner of sec. 9, T. 116 N., R. 64 W.; USGS Redfield S, SD topographic quadrangle; lat. 44 degrees 51 minutes 57 seconds N. and long. 98 degrees 32 minutes 13 seconds W.

Ap—0 to 6 inches; dark gray (10YR 4/1) fine sandy loam, black (10YR 2/1) moist; moderate fine and medium granular structure; slightly hard, very friable; common very fine and fine roots throughout; few very fine tubular pores; slightly acid; abrupt smooth boundary.

A—6 to 9 inches; dark grayish brown (10YR 4/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable; common very fine and fine roots throughout; few very fine tubular pores; neutral; clear smooth boundary.

Bw1—9 to 20 inches; brown (10YR 4/3) loam, dark brown (10YR 3/3) moist; weak medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, very friable; few very fine roots throughout; few very fine tubular pores; neutral; clear smooth boundary.

Bw2—20 to 36 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; soft, very friable; few very fine roots throughout; few very fine tubular pores; neutral; gradual wavy boundary.

BC—36 to 48 inches; light olive brown (2.5Y 5/3) fine sandy loam, olive brown (2.5Y 4/3) moist; weak fine subangular blocky structure; soft, very friable; few very fine roots throughout; few very fine tubular pores; slightly alkaline; gradual wavy boundary.

C1—48 to 65 inches; light yellowish brown (2.5Y 6/3) loamy sand, olive brown (2.5Y 4/3) moist; single grain; loose; 5 percent calcium carbonate equivalent; few iron stains throughout; slightly effervescent; slightly alkaline; gradual wavy boundary.

C2—65 to 80 inches; light yellowish brown (2.5Y 6/4) loamy sand, olive brown (2.5Y 4/4) moist; single grain; loose; 4 percent calcium carbonate equivalent; few iron stains throughout; slightly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 20 to 50 inches

Depth to carbonates: Greater than 40 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1 or 2

Texture - fine sandy loam but is sandy loam or loam in some pedons

Bw horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 1 to 3

Texture - fine sandy loam, sandy loam, or loam

BC horizon:

Hue - 10YR or 2.5Y; value - 4 to 7 (3 to 5 moist); and chroma - 2 or 3

Texture - fine sandy loam or sandy loam but is loamy sand or loamy fine sand in some pedons

C horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (3 to 6 moist); and chroma - 2 to 4

Texture - loamy fine sand or loamy sand but is sandy loam, fine sandy loam, sand, or fine sand in some pedons

Bon Series

Depth to restrictive feature: None

Drainage class: Moderately well drained

Permeability: Moderate

Landform: Flood plains

Parent material: Loamy alluvium

Slope: 0 to 2 percent

Typical Pedon

Bon loam, in an area of Bon loam, channeled, 1,700 feet south and 250 feet east of the northwest corner of sec. 23, T. 114 N., R. 61 W.; USGS Lake Byron NW, SD topographic quadrangle; lat. 44 degrees 40 minutes 18 seconds N. and long. 98 degrees 8 minutes 12 seconds W.

A1—0 to 8 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak fine granular structure; slightly hard, friable; many very fine roots throughout; common very fine tubular pores; 7 percent calcium carbonate equivalent; slightly effervescent; moderately alkaline; clear smooth boundary.

A2—8 to 14 inches; gray (10YR 5/1) loam, very dark gray (10YR 3/1) moist; weak fine subangular blocky structure parting to weak fine granular; slightly hard, friable; common very fine roots throughout; common very fine tubular pores; 9 percent calcium carbonate equivalent; strongly effervescent; moderately alkaline; clear smooth boundary.

Bw—14 to 26 inches; gray (10YR 5/1) loam, very dark gray (10YR 3/1) moist; weak fine and medium subangular blocky structure; slightly hard, friable; few very fine roots throughout; common very fine tubular pores; 10 percent calcium carbonate equivalent; strongly effervescent; moderately alkaline; gradual wavy boundary.

- Bk—26 to 40 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable; many very fine tubular pores; 14 percent calcium carbonate equivalent; common fine soft masses of carbonate; strongly effervescent; moderately alkaline; gradual wavy boundary.
- Ab—40 to 49 inches; very dark gray (10YR 3/1) loam, black (10YR 2/1) moist; weak fine subangular blocky structure; slightly hard, friable; many very fine tubular pores; 7 percent calcium carbonate equivalent; few fine soft masses of carbonate; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C1—49 to 69 inches; grayish brown (2.5Y 5/2) sandy loam, very dark grayish brown (2.5Y 3/2) moist; massive; slightly hard, friable; common very fine tubular pores; 8 percent calcium carbonate equivalent; few fine soft masses of carbonate; few fine prominent dark yellowish brown (10YR 4/4) redox concentrations and few fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; 5 percent gravel; moderately alkaline; gradual wavy boundary.
- C2—69 to 80 inches; gray (5Y 5/1) clay loam, very dark gray (5Y 3/1) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; 9 percent calcium carbonate equivalent; few fine and medium soft masses of carbonate; few fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; 1 percent gravel; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: Greater than 20 inches

Depth to carbonates: 0 to 20 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

Remarks: Some pedons lack an Ab horizon.

A horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 or 3 moist); and chroma - 1 or 2

Texture - loam but is silt loam or very fine sandy loam in some pedons

Bw horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 or 3 moist); and chroma - 1 to 3

Texture - loam, silt loam, or very fine sandy loam

Bk horizon:

Hue - 10YR or 2.5Y; value - 3 to 7 (2 to 5 moist); and chroma - 1 to 3

Texture - loam, silt loam, or fine sandy loam

C horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 3 to 7 (2 to 5 moist); and chroma - 1 to 3

Texture - loam, fine sandy loam, sandy loam, or clay loam but is stratified loamy fine sand, silt loam, or silty clay loam in some pedons

Bonilla Series

Depth to restrictive feature: None

Drainage class: Moderately well drained

Permeability: Moderately slow

Landform: Till plains

Parent material: Loamy glacial till

Slope: 0 to 6 percent

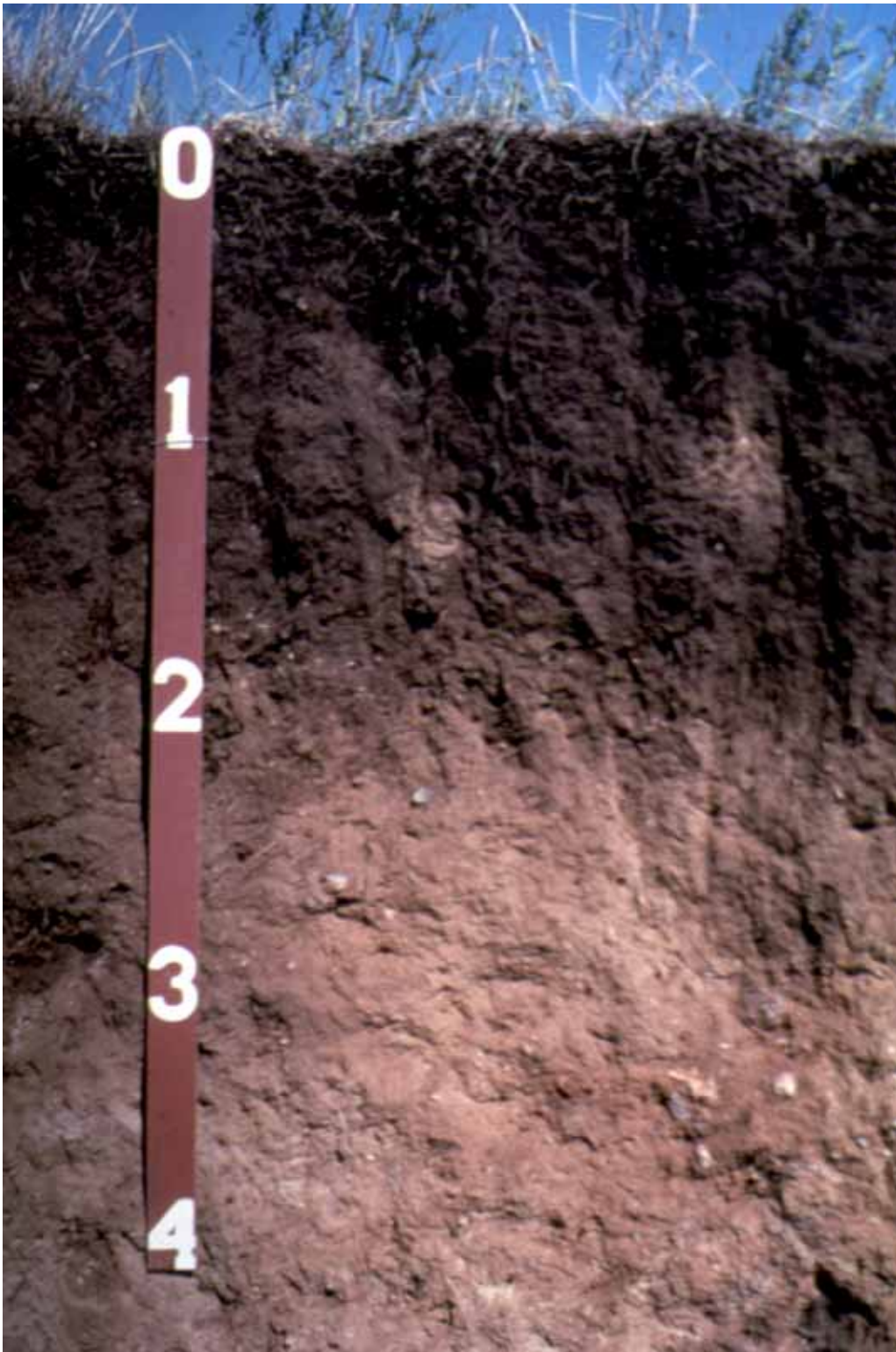


Figure 17. Profile of Bonilla loam. The soil is dark to a depth of about 23 inches. Depth is marked in feet.

Typical Pedon

Bonilla loam (fig. 17), in an area of Hand-Bonilla loams, 0 to 3 percent slopes, 165 feet east and 2,385 north of the southwest corner of sec. 27, T. 114 N., R. 65 W.;

USGS Tulare NW, SD topographic quadrangle; lat. 44 degrees 39 minutes 18 seconds N. and long. 98 degrees 38 minutes 40 seconds W.

- Ap—0 to 8 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak fine granular structure; slightly hard, friable; common very fine roots throughout; common very fine tubular pores; slightly acid; abrupt smooth boundary.
- Bw1—8 to 18 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; slightly hard, friable; few very fine roots throughout; common very fine tubular pores; neutral; clear smooth boundary.
- Bw2—18 to 27 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; slightly hard, friable; few very fine roots throughout; common very fine tubular pores; neutral; clear wavy boundary.
- Bk1—27 to 36 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable; common very fine tubular pores; 10 percent calcium carbonate equivalent; common fine soft masses of carbonate; strongly effervescent; slightly alkaline; gradual wavy boundary.
- Bk2—36 to 47 inches; pale yellow (2.5Y 7/3) loam, light olive brown (2.5Y 5/3) moist; weak fine and medium subangular blocky structure; slightly hard, friable; few very fine tubular pores; 19 percent calcium carbonate equivalent; common fine and medium soft masses of carbonate; few fine prominent dark yellowish brown (10YR 4/6) redox concentrations and few fine distinct gray (10YR 5/1) redox depletions; 2 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C1—47 to 61 inches; pale yellow (2.5Y 7/3) loam, light olive brown (2.5Y 5/3) moist; massive; slightly hard, friable; few very fine tubular pores; 15 percent calcium carbonate equivalent; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; 2 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C2—61 to 80 inches; pale yellow (2.5Y 7/3) loam, light olive brown (2.5Y 5/3) moist; massive; slightly hard, friable; few very fine tubular pores; 10 percent calcium carbonate equivalent; common fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations and many fine prominent gray (10YR 5/1) redox depletions; 2 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 20 to 40 inches

Depth to carbonates: 20 to 40 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 50 inches

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1 or 2

Texture - loam but is silt loam in some pedons

Bw horizon:

Hue - 10YR or 2.5Y; value - 4 to 6 (2 to 4 moist); and chroma - 1 to 3

Texture - loam or clay loam

Bk horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 6 or 7 (4 or 5 moist); and chroma - 1 to 3

Texture - loam or clay loam

C horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 6 or 7 (4 or 5 moist); and chroma - 1 to 4
Texture - loam or clay loam

Bowbells Series

Depth to restrictive feature: None

Drainage class: Well and moderately well drained

Permeability: Moderately slow

Landform: Till plains

Parent material: Loamy glacial till

Slope: 0 to 6 percent

Typical Pedon

Bowbells loam, in an area of Williams-Bowbells-Tonka complex, 0 to 6 percent slopes, 2,190 feet east and 1,000 feet south of the northwest corner of sec. 5, T. 120 N., R. 65 W.; USGS Chelsea, SD topographic quadrangle; lat. 45 degrees 14 minutes 27 seconds N. long. 98 degrees 41 minutes 21 seconds W.

- Ap—0 to 8 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots throughout; common very fine tubular pores; slightly acid; abrupt smooth boundary.
- Bt1—8 to 18 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, friable, slightly sticky and slightly plastic; many very fine and fine roots throughout; common very fine tubular pores; clay films on vertical faces of peds; neutral; clear smooth boundary.
- Bt2—18 to 28 inches; brown (10YR 5/3) clay loam, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; common very fine tubular pores; clay films on vertical faces of peds; slightly alkaline; clear wavy boundary.
- Bk1—28 to 46 inches; light yellowish brown (2.5Y 6/3) clay loam, olive brown (2.5Y 4/3) moist; weak fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine tubular pores; 9 percent calcium carbonate equivalent; common fine soft masses of carbonate; few fine prominent yellowish brown (10YR 5/6) redox concentrations and few fine distinct gray (10YR 6/1) redox depletions; strongly effervescent; moderately alkaline; clear wavy boundary.
- Bk2—46 to 56 inches; pale yellow (2.5Y 7/3) clay loam, light olive brown (2.5Y 5/3) moist; weak fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; many very fine tubular pores; 16 percent calcium carbonate equivalent; few iron stains throughout; many fine soft masses of carbonate; few fine prominent yellowish brown (10YR 5/6) redox concentrations and few fine prominent gray (10YR 6/1) redox depletions; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C1—56 to 70 inches; pale yellow (2.5Y 7/4) clay loam, olive brown (2.5Y 4/4) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; 14 percent calcium carbonate equivalent; few iron stains throughout; few fine soft masses of carbonate; many fine prominent yellowish brown (10YR 5/6) redox concentrations and common fine prominent gray (10YR 6/1) redox depletions; 2 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.

C2—70 to 80 inches; pale yellow (2.5Y 7/4) clay loam, olive brown (2.5Y 4/4) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; 14 percent calcium carbonate equivalent; few iron stains throughout; few fine soft masses of carbonate; many fine and medium distinct yellowish brown (10YR 5/6) redox concentrations and common fine prominent gray (10YR 6/1) redox depletions; 2 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 to 40 inches

Depth to carbonates: 16 to 40 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 40 inches

A horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 2

Texture - loam but is silt loam or clay loam in some pedons

Bt horizon:

Hue - 10YR or 2.5Y; value - 3 to 6 (2 to 4 moist); and chroma - 2 to 4

Texture - clay loam but is loam in some pedons

Bk horizon:

Hue - 10YR or 2.5Y; value - 4 to 7 (3 to 6 moist); and chroma - 2 to 4

Texture - loam or clay loam

C horizon:

Hue - 2.5Y; value - 4 to 7 (3 to 5 moist); and chroma - 2 to 4

Texture - loam or clay loam

Bowdle Series

Depth to restrictive feature: Strongly contrasting textural stratification; top depth ranges from 20 to 40 inches

Drainage class: Well drained

Permeability: Moderate in the loamy sediments and very rapid in the underlying gravelly material

Landform: Outwash plains

Parent material: Loamy alluvium over glacial outwash

Slope: 0 to 6 percent

Typical Pedon

Bowdle loam, in an area of Lehr-Bowdle loams, 0 to 3 percent slopes, 2,580 feet south and 930 feet east of the northwest corner of sec. 31, T. 120 N., R. 65 W.; USGS Chelsea, SD topographic quadrangle; lat. 45 degrees 9 minutes 55 seconds N. and long. 98 degrees 42 minutes 34 seconds W.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak fine and medium subangular blocky structure parting to weak fine granular; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; few very fine tubular pores; slightly acid; abrupt smooth boundary.

A—6 to 10 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; few very fine tubular pores; neutral; clear smooth boundary.

- Bw**—10 to 24 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; moderate medium and coarse prismatic structure parting to weak fine and medium subangular blocky; hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; few very fine tubular pores; neutral; clear smooth boundary.
- Bk**—24 to 29 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine tubular pores; 12 percent calcium carbonate equivalent; many fine and medium soft masses of carbonate; strongly effervescent; 5 percent gravel; slightly alkaline; clear smooth boundary.
- 2C1**—29 to 44 inches; light brownish gray (2.5Y 6/2) gravelly loamy sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose; 7 percent calcium carbonate equivalent; carbonate coats on sand and gravel; strongly effervescent; 30 percent gravel; slightly alkaline; gradual wavy boundary.
- 2C2**—44 to 80 inches; light yellowish brown (2.5Y 6/3) very gravelly loamy sand, olive brown (2.5Y 4/3) moist; single grain; loose; 8 percent calcium carbonate equivalent; carbonate coats on sand and gravel; strongly effervescent; 50 percent gravel; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 to 32 inches

Depth to carbonates: 14 to 32 inches

Depth to contrasting parent material: 20 to 40 inches over gravelly material

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1 or 2 (2 moist)

Texture - loam but is silt loam in some pedons

Bw horizon:

Hue - 10YR or 2.5Y; value - 3 to 6 (2 to 4 moist); and chroma - 1 to 3 (2 or 3 moist)

Texture - loam but is clay loam in some pedons

Bk horizon:

Hue - 10YR or 2.5Y; value - 4 to 7 (3 to 6 moist); and chroma - 2 to 4

Texture - loam or sandy loam but is gravelly sandy loam in some pedons

2C horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - gravelly loamy sand or very gravelly loamy sand but is gravelly sand or very gravelly sand in some pedons

Brookings Series

Depth to restrictive feature: None

Drainage class: Moderately well drained

Permeability: Moderately slow

Landform: Till plains

Parent material: Loess over loamy glacial till

Slope: 0 to 2 percent

Typical Pedon

Brookings silt loam (fig. 18), in an area of Kranzburg-Brookings silt loams, 0 to 2 percent slopes, 600 feet west and 1,550 feet north of the southeast corner of

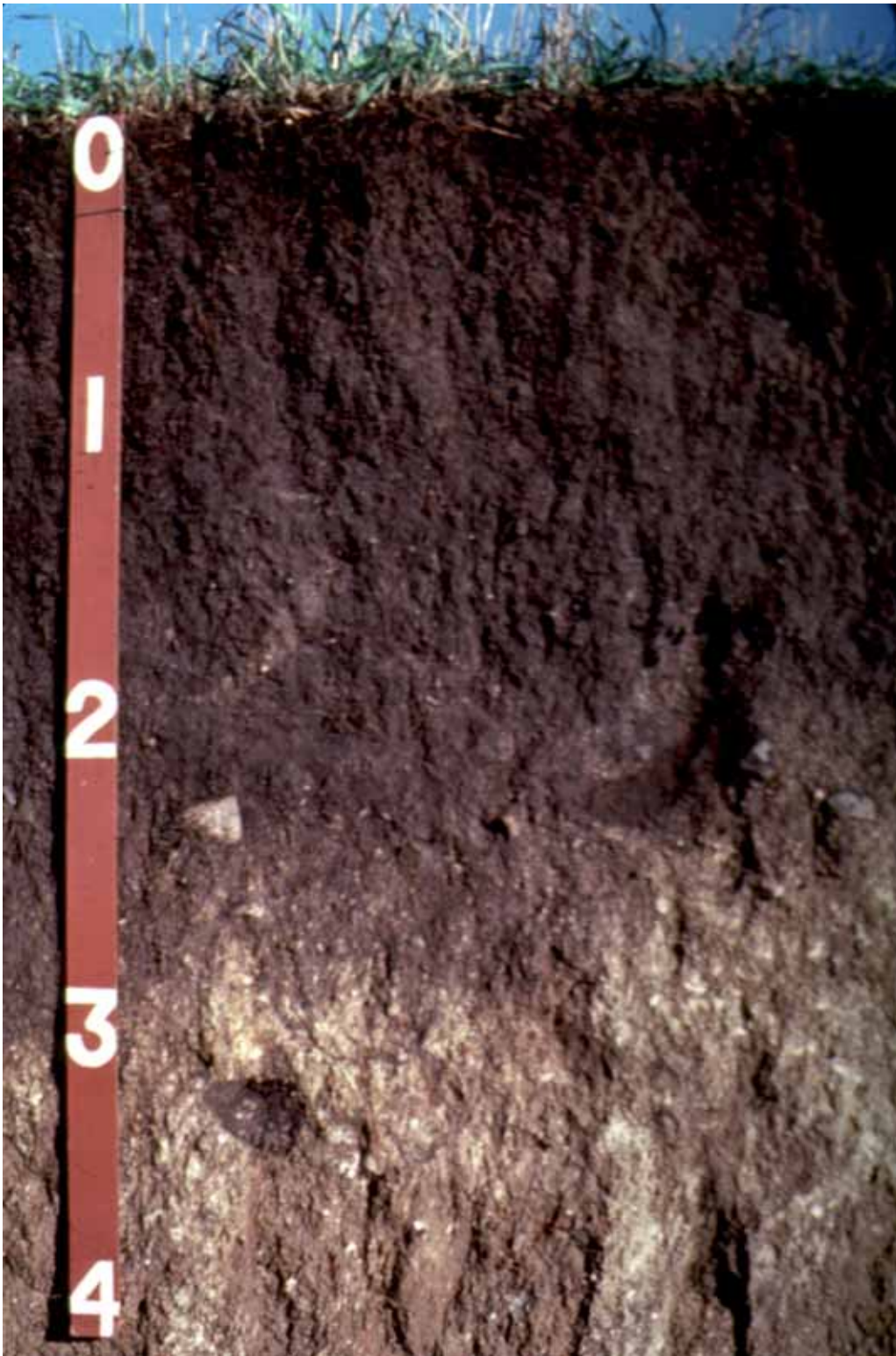


Figure 18. Profile of Brookings silt loam. There is about 26 inches of silt loam material over clay loam glacial till. The soil is dark to a depth of about 26 inches. Depth is marked in feet.

sec. 12, T. 118 N., R. 61 W.; USGS Turton, SD topographic quadrangle; lat. 45 degrees 2 minutes 33 seconds N. and long. 98 degrees 6 minutes 24 seconds W.

- Ap—0 to 8 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; moderate fine granular structure; slightly hard, friable; common very fine roots throughout; common very fine tubular pores; neutral; abrupt smooth boundary.
- A—8 to 15 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; weak fine and medium subangular blocky structure; slightly hard, friable; few very fine roots throughout; common very fine tubular pores; neutral; clear smooth boundary.
- Bw—15 to 25 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable; few very fine roots throughout; common very fine tubular pores; slightly alkaline; clear wavy boundary.
- Bk—25 to 35 inches; light yellowish brown (2.5Y 6/3) silt loam, olive brown (2.5Y 4/3) moist; weak medium prismatic structure; hard, friable; many very fine tubular pores; 23 percent calcium carbonate equivalent; common fine soft masses of carbonate; strongly effervescent; moderately alkaline; clear wavy boundary.
- 2C1—35 to 40 inches; light yellowish brown (2.5Y 6/4) loam, olive brown (2.5Y 4/4) moist; massive; hard, friable, slightly sticky and slightly plastic; common very fine tubular pores; 18 percent calcium carbonate equivalent; few fine soft masses of carbonate; few fine prominent dark yellowish brown (10YR 4/6) redox concentrations and few fine prominent gray (10YR 5/1) redox depletions; 5 percent pebbles; strongly effervescent; moderately alkaline; clear wavy boundary.
- 2C2—40 to 55 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; very hard, firm, slightly sticky and slightly plastic; common very fine tubular pores; 20 percent calcium carbonate equivalent; few fine soft masses of carbonate; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; 2 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
- 2C3—55 to 80 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; very hard, firm, slightly sticky and slightly plastic; few very fine tubular pores; 18 percent calcium carbonate equivalent; few fine soft masses of carbonate; many fine prominent dark yellowish brown (10YR 4/6) redox concentrations and many fine prominent gray (10YR 5/1) redox depletions; 2 percent pebbles; strongly effervescent; loosely alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 to 25 inches

Depth to carbonates: 20 to 38 inches

Depth to contrasting parent material: 20 to 40 inches over glacial till

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1

Texture - silt loam but is silty clay loam in some pedons

Bw horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 to 4 moist); and chroma - 1 to 4

Texture - silt loam but is silty clay loam in some pedons

Bk horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (4 or 5 moist); and chroma - 2 to 4

Texture - silt loam or silty clay loam

2C horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4
Texture - clay loam or loam

Buse Series

Depth to restrictive feature: None

Drainage class: Well drained

Permeability: Moderately slow

Landform: Till plains and moraines

Parent material: Loamy glacial till

Slope: 3 to 40 percent

Typical Pedon

Buse loam, in an area of Forman-Buse-Aastad loams, 1 to 6 percent slopes, 800 feet east and 450 feet south of the northwest corner of sec. 28, T. 115 N., R. 60 W.; USGS Bloomfield, SD topographic quadrangle; lat. 44 degrees 45 minutes 48 seconds N. and long. 98 degrees 3 minutes 18 seconds W.

- Ap—0 to 7 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak fine subangular blocky structure parting to weak fine granular; slightly hard, friable; common very fine and fine roots throughout; common very fine tubular pores; 7 percent calcium carbonate equivalent; slightly effervescent; 1 percent pebbles; neutral; clear smooth boundary.
- Bk1—7 to 21 inches; light brownish gray (10YR 6/2) loam, dark grayish brown (10YR 4/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; common very fine tubular pores; 21 percent calcium carbonate equivalent; common medium and coarse soft masses of carbonate; strongly effervescent; 1 percent pebbles; moderately alkaline; gradual wavy boundary.
- Bk2—21 to 35 inches; light brownish gray (10YR 6/2) clay loam, dark grayish brown (10YR 4/2) moist; weak fine and medium subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few very fine roots throughout; common very fine tubular pores; 18 percent calcium carbonate equivalent; few fine prominent dark yellowish brown (10YR 4/6) relict redox features; 1 percent pebbles; moderately alkaline; gradual wavy boundary.
- C1—35 to 63 inches; light yellowish brown (2.5Y 6/3) clay loam, olive brown (2.5Y 4/3) moist; massive; hard, firm, sticky and plastic; few very fine tubular pores; 13 percent calcium carbonate equivalent; few fine soft masses of carbonate; few fine prominent dark yellowish brown (10YR 4/6) relict redox features; 5 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C2—63 to 80 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, firm, sticky and plastic; few very fine tubular pores; 11 percent calcium carbonate equivalent; common fine prominent dark yellowish brown (10YR 4/6) and few fine prominent gray (10YR 5/1) relict redox features; 5 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 10 inches

Depth to carbonates: 0 to 4 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 1 or 2
Texture - loam but is clay loam in some pedons

Bk horizon:

Hue - 10YR or 2.5Y; value - 4 to 8 (4 to 6 moist); and chroma - 2 to 4
Texture - loam or clay loam

C horizon:

Hue - 10YR or 2.5Y; value - 4 to 7 (4 to 6 moist); and chroma - 2 to 6
Texture - loam or clay loam

Camtown Series

Depth to restrictive feature: None

Drainage class: Moderately well drained

Permeability: Slow

Landform: Lake plains

Parent material: Silty and loamy glaciolacustrine sediments

Slope: 0 to 2 percent

Typical Pedon

Camtown loam, in an area of Camtown-Turton loams, 0 to 2 percent slopes, 120 feet north and 2,350 feet east of the southwest corner of sec. 10, T. 119 N., R. 63 W.; USGS Mellette, SD topographic quadrangle; lat. 45 degrees 8 minutes 4 seconds N. and long. 98 degrees 23 minutes 27 seconds W.

- Ap—0 to 8 inches; very dark gray (10YR 3/1) loam, black (10YR 2/1) moist; moderate fine and medium subangular blocky structure parting to moderate fine granular; slightly hard, friable; few very fine roots throughout; few very fine tubular pores; slightly acid; abrupt smooth boundary.
- A—8 to 14 inches; very dark gray (10YR 3/1) loam, black (10YR 2/1) moist; moderate medium subangular blocky structure parting to moderate fine granular; slightly hard, friable; few very fine roots throughout; few very fine tubular pores; neutral; clear smooth boundary.
- BE—14 to 19 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate medium and coarse subangular blocky structure; slightly hard, friable; few very fine roots throughout; common very fine tubular pores; gray (10YR 5/1) coats on faces of peds and in pores; neutral; clear smooth boundary.
- B_{tn}1—19 to 31 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine tubular pores; clay films on vertical faces of peds; slightly alkaline; clear wavy boundary.
- B_{tn}2—31 to 36 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; weak medium and coarse prismatic structure parting to moderate medium subangular blocky; hard, friable, slightly sticky and slightly plastic; common very fine tubular pores; clay films on vertical faces of peds; slightly alkaline; clear wavy boundary.
- Bk—36 to 48 inches; pale yellow (2.5Y 7/3) silt loam, light olive brown (2.5Y 5/3) moist; weak medium prismatic structure parting to moderate medium subangular blocky; hard, friable, slightly sticky and slightly plastic; common very fine tubular pores; 13 percent calcium carbonate equivalent; few fine distinct dark yellowish brown (10YR 4/4) redox concentrations; strongly effervescent; moderately alkaline; clear wavy boundary.

- C1—48 to 70 inches; light yellowish brown (2.5Y 6/4) very fine sandy loam, olive brown (2.5Y 4/4) moist; massive; soft, very friable; few very fine tubular pores; 7 percent calcium carbonate equivalent; common fine distinct dark yellowish brown (10YR 4/4) redox concentrations; slightly effervescent; slightly alkaline; gradual wavy boundary.
- C2—70 to 80 inches; pale yellow (2.5Y 7/4) very fine sandy loam, light olive brown (2.5Y 5/4) moist; massive; soft, very friable; 6 percent calcium carbonate equivalent; many fine and medium distinct dark yellowish brown (10YR 4/4) redox concentrations and many fine and medium prominent gray (10YR 5/1) redox depletions; slightly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 to 40 inches

Depth to carbonates: 16 to 38 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 25 inches

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1

Texture - loam but is fine sandy loam or very fine sandy loam in some pedons

BE horizon:

Hue - 10YR; value - 4 or 5 (3 or 4 moist); and chroma - 1 or 2

Texture - loam, very fine sandy loam, or fine sandy loam

Btn horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 to 4 moist); and chroma - 1 to 4

Texture - loam, silt loam, silty clay loam, or clay loam

Bk horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 1 to 4

Texture - loam, silt loam, silty clay loam, or very fine sandy loam

C horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - loam, silt loam, silty clay loam, or very fine sandy loam

Carthage Series

Depth to restrictive feature: None

Drainage class: Moderately well drained

Permeability: Moderately rapid in the loamy sediments and moderately slow in the underlying glacial till

Landform: Till plains

Parent material: Loamy glaciofluvial sediments over loamy glacial till

Slope: 0 to 2 percent

Typical Pedon

Carthage fine sandy loam, in an area of Hand-Carthage-Overshue fine sandy loams, 0 to 3 percent slopes, 2,250 feet south and 300 feet east of the northwest corner of sec. 3, T. 114 N., R. 64 W.; USGS Tulare, SD topographic quadrangle; lat. 44 degrees 42 minutes 48 seconds N. and long. 98 degrees 31 minutes 21 seconds W.

Ap—0 to 7 inches; dark gray (10YR 4/1) fine sandy loam, black (10YR 2/1) moist; weak fine granular structure; soft, very friable; common very fine and fine roots throughout; common very fine tubular pores; neutral; abrupt smooth boundary.

- A—7 to 16 inches; dark gray (10YR 4/1) fine sandy loam, black (10YR 2/1) moist; weak fine subangular blocky structure parting to weak fine granular; soft, very friable; common very fine and fine roots throughout; common very fine tubular pores; neutral; clear smooth boundary.
- Bw—16 to 24 inches; dark grayish brown (10YR 4/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; soft, very friable; few very fine roots throughout; few very fine tubular pores; neutral; abrupt wavy boundary.
- 2C1—24 to 43 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; few very fine tubular pores; 12 percent calcium carbonate equivalent; few fine soft masses of carbonate; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations and few fine distinct gray (10YR 5/1) redox depletions; strongly effervescent; 2 percent pebbles; moderately alkaline; gradual wavy boundary.
- 2C2—43 to 80 inches; light gray (2.5Y 7/2) clay loam, grayish brown (2.5Y 5/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; 12 percent calcium carbonate equivalent; few fine soft masses of carbonate and few fine soft masses of iron-manganese; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine distinct gray (10YR 5/1) redox depletions; strongly effervescent; 2 percent pebbles; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 20 to 40 inches

Depth to carbonates: 20 to 40 inches

Depth to contrasting parent material: 20 to 40 inches over glacial till

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

Remarks: Some pedons have a C horizon.

A horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 1 or 2

Texture - fine sandy loam but is loam or sandy loam in some pedons

Bw horizon:

Hue - 10YR; value - 3 to 5 (2 to 4 moist); and chroma - 1 to 4

Texture - fine sandy loam but is sandy loam in some pedons

2C horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - loam or clay loam

Cavour Series

Depth to restrictive feature: Natric; top depth ranges from 4 to 18 inches

Drainage class: Moderately well drained

Permeability: Very slow

Landform: Till plains

Parent material: Loamy glacial till

Slope: 0 to 2 percent

Typical Pedon

Cavour loam, in an area of Cresbard-Cavour-Heil complex, 0 to 2 percent slopes, 700 feet south and 950 feet east of the northwest corner of sec. 21, T. 117 N., R. 60 W.; USGS Doland, SD topographic quadrangle; lat. 44 degrees 55 minutes 53 seconds N. and long. 98 degrees 3 minutes 40 seconds W.

- Ap—0 to 5 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak fine subangular blocky structure parting to weak fine granular; slightly hard, very friable; many very fine and fine roots throughout; few very fine tubular pores; slightly acid; clear smooth boundary.
- E—5 to 9 inches; light brownish gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist; weak thin platy structure parting to weak fine granular; slightly hard, very friable; common very fine and fine roots throughout; common very fine and fine tubular pores; neutral; clear smooth boundary.
- Btn1—9 to 13 inches; gray (10YR 5/1) silty clay, very dark gray (10YR 3/1) moist; moderate medium columnar structure; extremely hard, very firm, sticky and plastic; common very fine roots between peds; few very fine tubular pores; light brownish gray (10YR 6/2) coats on tops of columns and clay films on vertical faces of peds; 1 percent pebbles; moderately alkaline; clear smooth boundary.
- Btn2—13 to 18 inches; gray (10YR 5/1) silty clay, very dark gray (10YR 3/1) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; extremely hard, very firm, sticky and plastic; common very fine roots between peds; few very fine tubular pores; clay films on vertical faces of peds; 1 percent pebbles; moderately alkaline; gradual wavy boundary.
- Btnz—18 to 22 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to weak fine subangular blocky; very hard, firm, slightly sticky and slightly plastic; few very fine roots between peds; few very fine tubular pores; clay films on vertical faces of peds; common fine salt masses; 1 percent pebbles; moderately alkaline; clear wavy boundary.
- Bkz1—22 to 30 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak medium subangular blocky structure; very hard, firm, slightly sticky and slightly plastic; few very fine roots between peds; few very fine tubular pores; 20 percent calcium carbonate equivalent; common fine and medium soft masses of carbonate and common fine salt masses; strongly effervescent; 1 percent pebbles; strongly alkaline; gradual wavy boundary.
- Bkz2—30 to 45 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak medium subangular blocky structure; very hard, firm, slightly sticky and slightly plastic; few very fine tubular pores; 16 percent calcium carbonate equivalent; common fine soft masses of carbonate and common fine salt masses; few fine prominent dark yellowish brown (10YR 4/6) redox concentrations and few fine prominent gray (10YR 5/1) redox depletions; 3 percent pebbles; strongly effervescent; strongly alkaline; clear wavy boundary.
- C1—45 to 65 inches; light gray (2.5Y 7/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; very hard, firm, slightly sticky and slightly plastic; few very fine tubular pores; 9 percent calcium carbonate equivalent; few fine prominent dark yellowish brown (10YR 4/6) redox concentrations and few fine prominent gray (10YR 5/1) redox depletions; 3 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C2—65 to 80 inches; pale yellow (2.5Y 7/4) clay loam, light olive brown (2.5Y 5/4) moist; massive; very hard, firm, slightly sticky and slightly plastic; few very fine tubular pores; 7 percent calcium carbonate equivalent; common fine prominent

dark yellowish brown (10YR 4/6) redox concentrations and few fine prominent gray (10YR 5/1) redox depletions; 3 percent pebbles; slightly effervescent; slightly alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 35 inches

Depth to carbonates: 14 to 35 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: 16 to 45 inches

A horizon:

Hue - 10YR or neutral; value - 3 to 5 (2 or 3 moist); and chroma - 0 or 1

Texture - loam but is silt loam or clay loam in some pedons

E horizon:

Hue - 10YR; value - 3 to 7 (2 to 5 moist); and chroma - 1 or 2

Texture - silt loam or loam

Btn and Btnz horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 3 to 5 (2 to 4 moist); and chroma - 1 to 3

Texture - clay loam, clay, silty clay, or silty clay loam

Bkz horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 5 or 6 (4 or 5 moist); and chroma - 1 to 3

Texture - loam, clay loam, silty clay loam, silty clay, or clay

C horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (4 or 5 moist); and chroma - 1 to 4

Texture - loam or clay loam

Colvin Series

Depth to restrictive feature: None

Drainage class: Poorly drained

Permeability: Moderately slow in the solum and moderate to slow in the underlying material

Landform: Lake plains

Parent material: Silty glaciolacustrine sediments

Slope: 0 to 1 percent

Typical Pedon

Colvin silty clay loam, saline, 0 to 1 percent slopes, 800 feet north and 125 feet west of the southeast corner of sec. 24, T. 120 N., R. 62 W.; USGS Randolph, SD topographic quadrangle; lat. 45 degrees 11 minutes 13 seconds N. and long. 98 degrees 13 minutes 44 seconds W.

Apz—0 to 7 inches; very dark gray (10YR 3/1) silty clay loam, black (10YR 2/1) moist; weak fine granular structure; slightly hard, friable; common very fine roots throughout; few very fine tubular pores; 7 percent calcium carbonate equivalent; common fine salt masses; slightly effervescent; moderately alkaline; abrupt smooth boundary.

ABkz—7 to 14 inches; dark gray (10YR 4/1) silt loam, very dark gray (10YR 3/1) moist; weak fine subangular blocky structure; slightly hard, friable; few very fine roots throughout; common very fine tubular pores; 10 percent calcium carbonate equivalent; many fine salt masses; strongly effervescent; moderately alkaline; clear smooth boundary.

- Bkg1**—14 to 31 inches; gray (2.5Y 6/1) silt loam, dark grayish brown (2.5Y 4/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable; few very fine roots throughout; common very fine tubular pores; 32 percent calcium carbonate equivalent; few fine prominent dark yellowish brown (10YR 4/6) redox concentrations; violently effervescent; strongly alkaline; gradual wavy boundary.
- Bkg2**—31 to 44 inches; light yellowish brown (2.5Y 6/3) silt loam, olive brown (2.5Y 4/3) moist; weak medium subangular blocky structure; slightly hard, friable; common very fine tubular pores; 20 percent calcium carbonate equivalent; few fine prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine prominent gray (10YR 6/1) redox depletions; violently effervescent; strongly alkaline; gradual wavy boundary.
- Cg1**—44 to 54 inches; light gray (5Y 7/1) silt loam, olive gray (5Y 5/2) moist; massive; slightly hard, friable; common very fine tubular pores; varved with very fine sand to clay; 10 percent calcium carbonate equivalent; many fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations and few fine distinct gray (10YR 6/1) redox depletions; strongly effervescent; strongly alkaline; gradual wavy boundary.
- Cg2**—54 to 80 inches; light gray (5Y 7/1) silt loam, olive gray (5Y 5/2) moist; massive; slightly hard, very friable; few very fine tubular pores; varved with very fine sand to clay; 11 percent calcium carbonate equivalent; many medium and coarse prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine and medium distinct gray (10YR 6/1) redox depletions; strongly effervescent; strongly alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 24 inches

Depth to carbonates: 0 to 6 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: 0 to 10 inches

Remarks: Some pedons lack an ABkz horizon.

A horizon:

Hue - 10YR, 2.5Y, 5Y, or neutral; value - 3 or 4 (2 or 3 moist); and chroma - 0 or 1

Texture - silty clay loam but is silt loam in some pedons

Ak or ABk horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 4 to 6 (3 or 4 moist); and chroma - 1 or 2

Texture - silt loam or silty clay loam

Bkg horizon:

Hue - 10YR, 2.5Y, 5Y, or neutral; value - 5 to 8 (3 to 7 moist); and chroma - 0 to 3

Texture - silt loam or silty clay loam

Cg horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (3 to 6 moist); and chroma - 1 to 4

Texture - silt loam or silty clay loam and typically is varved with very fine sand to clay in the lower part

Cresbard Series

Depth to restrictive feature: None

Drainage class: Moderately well drained

Permeability: Slow

Landform: Till plains

Parent material: Loamy glacial till

Slope: 0 to 6 percent

Typical Pedon

Cresbard loam, in an area of Cresbard-Cavour loams, 0 to 2 percent slopes, 2,410 feet west and 1,600 feet north of the southeast corner of sec. 4, T. 120 N., R. 60 W.; USGS Conde, SD topographic quadrangle; lat. 45 degrees 12 minutes 56 seconds N. and long. 98 degrees 0 minutes 38 seconds W.

- Ap—0 to 6 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak fine subangular blocky structure parting to weak fine granular; slightly hard, friable; many very fine and fine roots throughout; common very fine tubular pores; neutral; abrupt smooth boundary.
- E—6 to 8 inches; gray (10YR 5/1) loam, very dark gray (10YR 3/1) moist; weak thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots throughout; common very fine tubular pores; neutral; clear smooth boundary.
- BE—8 to 11 inches; dark gray (10YR 4/1) and gray (10YR 5/1) clay loam, very dark gray (10YR 3/1) moist; weak medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; common very fine tubular pores; neutral; clear smooth boundary.
- Btn—11 to 22 inches; dark gray (10YR 4/1) clay loam, very dark gray (10YR 3/1) moist; moderate medium and coarse prismatic structure parting to moderate fine and medium angular blocky; hard, firm, sticky and plastic; few very fine roots between peds; few very fine tubular pores; clay films on vertical faces of peds; slightly alkaline; clear wavy boundary.
- Bk1—22 to 28 inches; pale yellow (2.5Y 7/3) clay loam, light olive brown (2.5Y 5/3) moist; weak fine and medium subangular blocky structure; very hard, firm, sticky and plastic; few very fine roots throughout; few very fine tubular pores; 16 percent calcium carbonate equivalent; common medium and coarse soft masses of carbonate; strongly effervescent; 2 percent pebbles; moderately alkaline; clear wavy boundary.
- Bk2—28 to 38 inches; light yellowish brown (2.5Y 6/3) clay loam, olive brown (2.5Y 4/3) moist; weak fine and medium subangular blocky structure; very hard, firm, sticky and plastic; few very fine roots throughout; few very fine tubular pores; 12 percent calcium carbonate equivalent; common fine and medium soft masses of carbonate; few fine prominent dark yellowish brown (10YR 4/6) redox concentrations and few fine prominent gray (10YR 6/1) redox depletions; 2 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C1—38 to 66 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; very hard, firm, sticky and plastic; few very fine tubular pores; 7 percent calcium carbonate equivalent; few iron stains; few fine soft masses of iron-manganese and few fine gypsum crystals; many fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine prominent gray (10YR 6/1) redox depletions; 4 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C2—66 to 80 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; very hard, firm, sticky and plastic; few very fine tubular pores; 1 percent shale chips; 6 percent calcium carbonate equivalent; few iron stains; few fine soft masses of iron-manganese and few fine gypsum crystals; common fine prominent dark yellowish brown (10YR 4/6) redox

concentrations and few fine prominent gray (10YR 6/1) redox depletions; 4 percent pebbles; strongly effervescent; strongly alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 to 36 inches

Depth to carbonates: 15 to 40 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 35 inches

Remarks: Some pedons have an EB horizon.

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1 or 2

Texture - loam or silt loam

E horizon:

Hue - 10YR; value - 5 or 6 (2 to 4 moist); and chroma - 1 or 2

Texture - loam or silt loam

Btn horizon:

Hue - 10YR or 2.5Y; value - 3 to 6 (2 to 4 moist); and chroma - 1 to 3

Texture - silty clay, clay loam, or clay

Bk horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - clay loam or loam

C horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - clay loam or loam

Crossplain Series

Depth to restrictive feature: None

Drainage class: Somewhat poorly drained

Permeability: Slow

Landform: Till plains

Parent material: Local clayey alluvium over loamy glacial till

Slope: 0 to 1 percent

Typical Pedon

Crossplain loam, in an area of Crossplain-Tetonka complex, 0 to 1 percent slopes, 1,400 feet south and 290 feet east of the northwest corner of sec. 32, T. 116 N., R. 65 W.; USGS Redfield SW, SD topographic quadrangle; lat. 44 degrees 49 minutes 5 seconds N. and long. 98 degrees 41 minutes 6 seconds W.

A—0 to 6 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak fine and medium subangular blocky structure parting to weak fine granular; hard, friable; many very fine and fine roots throughout; common very fine tubular pores; neutral; clear wavy boundary.

AB—6 to 15 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak fine and medium subangular blocky structure; hard, friable; common very fine and fine roots throughout; common very fine tubular pores; neutral; clear wavy boundary.

Bt—15 to 30 inches; very dark grayish brown (10YR 3/2) clay loam, black (10YR 2/1) moist; moderate medium and coarse prismatic structure parting to moderate medium and coarse subangular blocky; very hard, firm, sticky and plastic; few

very fine roots between peds; few very fine tubular pores; clay films on vertical faces of peds; neutral; gradual wavy boundary.

- Bkg1—30 to 45 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure parting to weak fine and medium subangular blocky; hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine tubular pores; 20 percent calcium carbonate equivalent; common fine soft masses of carbonate; few fine prominent dark yellowish brown (10YR 4/6) redox concentrations; strongly effervescent; slightly alkaline; gradual wavy boundary.
- Bkg2—45 to 59 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure parting to weak fine and medium subangular blocky; very hard, firm, sticky and plastic; common very fine tubular pores; 14 percent calcium carbonate equivalent; common fine soft masses of carbonate; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; slightly alkaline; gradual wavy boundary.
- 2Cg—59 to 80 inches; light yellowish brown (2.5Y 6/3) clay loam, olive brown (2.5Y 4/3) moist; massive; very hard, firm, sticky and plastic; common very fine tubular pores; 9 percent calcium carbonate equivalent; few fine soft masses of carbonate and few fine soft masses of iron-manganese; many fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; 2 percent pebbles; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 20 to 36 inches

Depth to carbonates: 16 to 48 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 40 inches

Remarks: Some pedons have a C horizon.

A horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 or 3 moist); and chroma - 1

Texture - loam but is silt loam, silty clay loam, or clay loam in some pedons

Bt horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 3 to 6 (2 to 4 moist); and chroma - 1 or 2

Texture - clay loam or clay

Bk horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (4 or 5 moist); and chroma - 1 to 3

Texture - clay loam or loam

2C horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (4 or 5 moist); and chroma - 1 to 3

Texture - loam or clay loam

Davis Series

Depth to restrictive feature: None

Drainage class: Moderately well drained

Permeability: Moderate

Landform: Flood plains

Parent material: Loamy alluvium

Slope: 0 to 2 percent

Typical Pedon

Davis loam, in an area of Davis-Northville complex, 0 to 2 percent slopes, 2,200 feet east and 625 feet south of the northwest corner of sec. 22, T. 114 N., R. 61 W.; lat. 44 degrees 40 minutes 25 seconds N and long. 98 degrees 9 minutes 1 second W.

- Ap—0 to 6 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak fine and medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; common very fine tubular pores; neutral; abrupt smooth boundary.
- Bw1—6 to 15 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak medium and coarse prismatic structure parting to weak medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; common very fine and fine tubular pores; slightly alkaline; clear smooth boundary.
- Bw2—15 to 28 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine and fine tubular pores; slightly alkaline; clear smooth boundary.
- Bk1—28 to 40 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine tubular pores; 14 percent calcium carbonate equivalent; many fine and medium soft masses of carbonate; strongly effervescent; moderately alkaline; gradual wavy boundary.
- Bk2—40 to 56 inches; grayish brown (2.5Y 5/2) clay loam, very dark grayish brown (2.5Y 3/2) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; hard, firm, sticky and plastic; common very fine tubular pores; 14 percent calcium carbonate equivalent; many medium and coarse soft masses of carbonate; strongly effervescent; moderately alkaline; gradual wavy boundary.
- Bk3—56 to 65 inches; dark grayish brown (2.5Y 4/2) loam, very dark grayish brown (2.5Y 3/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine tubular pores; 12 percent calcium carbonate equivalent; common fine soft masses of carbonate; strongly effervescent; moderately alkaline; gradual wavy boundary.
- Ab—65 to 72 inches; dark gray (2.5Y 4/1) clay loam, black (2.5Y 2.5/1) moist; weak fine and medium subangular blocky structure parting to weak fine and medium granular; hard, friable, sticky and plastic; common very fine tubular pores; 9 percent calcium carbonate equivalent; common fine soft masses of carbonate; strongly effervescent; moderately alkaline; clear wavy boundary.
- C—72 to 80 inches; light gray (2.5Y 7/2) loam, grayish brown (2.5Y 5/2) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; 14 percent calcium carbonate equivalent; few fine soft masses of carbonate; common fine prominent yellowish brown (10YR 5/6) redox concentrations and common fine distinct gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: Greater than 20 inches

Depth to carbonates: Greater than 20 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

Remarks: Some pedons have a BA horizon. Some pedons lack an Ab or C horizon.

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1 or 2

Texture - loam but is silt loam in some pedons

Bw horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 to 4 moist); and chroma - 1 to 3

Texture - loam, silt loam, or clay loam

Bk horizon:

Hue - 10YR or 2.5Y; value - 3 to 6 (2 to 5 moist); and chroma - 1 to 4

Texture - loam, silt loam, or clay loam

C horizon:

Hue - 10YR or 2.5Y; value - 3 to 7 (2 to 5 moist); and chroma - 1 to 4

Texture - loam but is stratified sandy loam, silt loam, silty clay loam, or clay loam in some pedons

Davison Series

Depth to restrictive feature: None

Drainage class: Somewhat poorly drained

Permeability: Moderately slow

Landform: Till plains and flood plains

Parent material: Loamy glacial till

Slope: 0 to 2 percent

Typical Pedon

Davison loam, in an area of Davison-Tetonka complex, 0 to 2 percent slopes, 250 feet north and 750 feet west of the southeast corner of sec. 2, T. 114 N., R. 65 W.; USGS Tulare S., SD topographic quadrangle; lat. 44 degrees 42 minutes 25 seconds N. and long. 98 degrees 36 minutes 27 seconds W.

Ap—0 to 8 inches; dark gray (10YR 4/1) loam, very dark gray (10YR 3/1) moist; weak fine granular structure; slightly hard, friable; common very fine roots throughout; common very fine tubular pores; 9 percent calcium carbonate equivalent; strongly effervescent; slightly alkaline; abrupt smooth boundary.

Bk1—8 to 19 inches; pale yellow (2.5Y 7/3) loam, light olive brown (2.5Y 5/3) moist; weak fine and medium subangular blocky structure; slightly hard, friable; common very fine roots throughout; common very fine tubular pores; 29 percent calcium carbonate equivalent; common fine and medium soft masses of carbonate; violently effervescent; moderately alkaline; clear smooth boundary.

Bk2—19 to 28 inches; pale yellow (2.5Y 7/3) loam, light olive brown (2.5Y 5/3) moist; weak fine and medium subangular blocky structure; slightly hard, friable; few very fine roots throughout; common very fine tubular pores; 18 percent calcium carbonate equivalent; common fine soft masses of carbonate; common fine distinct dark yellowish brown (10YR 4/4) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; violently effervescent; moderately alkaline; clear smooth boundary.

Cg1—28 to 53 inches; light yellowish brown (2.5Y 6/3) clay loam, olive brown (2.5Y 4/3) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; 12 percent calcium carbonate equivalent; few fine nests of gypsum and few fine soft masses of iron-manganese; common fine distinct

dark yellowish brown (10YR 4/4) redox concentrations and many fine prominent gray (10YR 5/1) redox depletions; 1 percent pebbles; strongly effervescent; slightly alkaline; gradual wavy boundary.

Cg2—53 to 80 inches; light yellowish brown (2.5Y 6/3) clay loam, olive brown (2.5Y 4/3) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; 13 percent calcium carbonate equivalent; few fine soft masses of iron-manganese; many fine and medium distinct dark yellowish brown (10YR 4/4) redox concentrations and many fine and medium prominent gray (10YR 5/1) redox depletions; 1 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 15 inches

Depth to carbonates: 0 to 6 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 30 inches

A horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 1 or 2

Texture - loam

Bk horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (4 or 5 moist); and chroma - 2 to 4

Texture - loam or clay loam

C horizon:

Hue - 2.5Y or 5Y; value - 5 to 8 (4 to 6 moist); and chroma - 1 to 4

Texture - loam or clay loam

Delmont Series

Depth to restrictive feature: Strongly contrasting textural stratification; top depth ranges from 14 to 20 inches

Drainage class: Somewhat excessively drained

Permeability: Moderate in the loamy sediments and very rapid in the underlying gravelly material

Landform: Outwash plains

Parent material: Loamy alluvium over glacial outwash

Slope: 0 to 2 percent

Typical Pedon

Delmont loam, in an area of Delmont-Enet loams, 0 to 2 percent slopes, 850 feet west and 340 feet north of the southeast corner of sec. 14, T. 115 N., R. 64 W.; USGS Frankfort SW, SD topographic quadrangle lat. 44 degrees 45 minutes 53 seconds N. and long. 98 degrees 29 minutes 11 seconds W.

Ap—0 to 7 inches; very dark gray (10YR 3/1) loam, black (10YR 2/1) moist; weak fine and medium subangular blocky structure parting to moderate fine granular; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots throughout; few very fine tubular pores; neutral; abrupt smooth boundary.

Bw—7 to 16 inches; very dark grayish brown (10YR 3/2) loam, very dark brown (10YR 2/2) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine

roots throughout; few very fine tubular pores; slightly alkaline; clear wavy boundary.

2Bk—16 to 22 inches; grayish brown (2.5Y 5/2) gravelly loamy sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose; few very fine roots throughout; 10 percent calcium carbonate equivalent; few carbonate coats on sand and gravel; 20 percent gravel; strongly effervescent; moderately alkaline; gradual wavy boundary.

2C—22 to 80 inches; light olive brown (2.5Y 5/3) gravelly loamy sand, olive brown (2.5Y 4/3) moist; single grain; loose; 8 percent calcium carbonate equivalent; few carbonate coats on sand and gravel; 25 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 10 to 20 inches

Depth to carbonates: 14 to 20 inches

Depth to contrasting parent material: 14 to 20 inches over gravelly material

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

Remarks: Some pedons lack a 2Bk horizon.

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1 to 3

Texture - loam but is very fine sandy loam in some pedons

Bw horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 1 to 3

Texture - loam but is sandy loam or fine sandy loam in some pedons

2Bk or 2C horizon:

Hue - 5YR to 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - gravelly sand, gravelly loamy sand, very gravelly loamy sand, or very gravelly sand

Dimo Series

Depth to restrictive feature: Strongly contrasting textural stratification; top depth ranges from 20 to 40 inches

Drainage class: Moderately well and somewhat poorly drained

Permeability: Moderate in the loamy sediments and very rapid in the underlying gravelly material

Landform: Outwash plains

Parent material: Loamy alluvium over glacial outwash

Slope: 0 to 2 percent

Typical Pedon

Dimo loam, 0 to 2 percent slopes, 2,200 feet north and 375 feet east of the southwest corner of sec. 36, T. 114 N., R. 61 W.; USGS Bloomfield, SD topographic quadrangle; lat. 44 degrees 38 minutes 16 seconds N. and long. 98 degrees 7 minutes 2 seconds W.

Ap—0 to 7 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak fine subangular blocky structure parting to weak fine granular; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; common very fine tubular pores; neutral; abrupt smooth boundary.

- Bw1—7 to 18 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine tubular pores; neutral; clear smooth boundary.
- Bw2—18 to 26 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine tubular pores; few fine faint dark yellowish brown (10YR 4/4) redox concentrations; neutral; clear smooth boundary.
- Bk1—26 to 31 inches; grayish brown (2.5Y 5/2) loam, dark grayish brown (2.5Y 4/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; 25 percent calcium carbonate equivalent; common fine and medium soft masses of carbonate; common fine prominent dark yellowish brown (10YR 4/4) redox concentrations; strongly effervescent; moderately alkaline; gradual wavy boundary.
- 2Bk2—31 to 43 inches; light yellowish brown (2.5Y 6/3) gravelly loamy sand, olive brown (2.5Y 4/3) moist; single grain; loose; 20 percent calcium carbonate equivalent; carbonate coats on sand and gravel; common fine distinct dark yellowish brown (10YR 4/4) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; 30 percent gravel; strongly effervescent; moderately alkaline; gradual wavy boundary.
- 2C1—43 to 61 inches; light brownish gray (2.5Y 6/2) very gravelly loamy sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose; 19 percent calcium carbonate equivalent; carbonate coats on sand and gravel; common fine prominent dark yellowish brown (10YR 4/4) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; 40 percent gravel; strongly effervescent; moderately alkaline; gradual wavy boundary.
- 3C2—61 to 80 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, firm, sticky and plastic; few very fine tubular pores; 15 percent calcium carbonate equivalent; common fine and medium prominent dark yellowish brown (10YR 4/4) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; 2 percent pebbles; strongly effervescent; slightly alkaline.

Range in Characteristics

Mollic epipedon thickness: 20 to 40 inches

Depth to carbonates: 20 to 40 inches

Depth to contrasting parent material: 20 to 40 inches over gravelly material

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

Remarks: Some pedons lack a Bk or 2Bk horizon.

A horizon:

Hue - 10YR or 2.5Y; value - 3 or 4 (2 moist); and chroma - 1 or 2

Texture - loam but is clay loam in some pedons

Bw horizon:

Hue - 10YR, 2.5Y, or neutral; value - 3 to 5 (2 to 4 moist); and chroma - 0 to 2

Texture - loam but is clay loam or sandy clay loam in some pedons

Bk horizon:

Hue - 2.5Y or 5Y; value - 5 to 8 (4 to 6 moist); and chroma - 1 to 3

Texture - loam but is clay loam, sandy loam, or loamy sand in some pedons

2Bk or 2C horizon:

Hue - 7.5YR, 10YR, or 2.5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4
 Texture - gravelly sand, gravelly loamy sand, very gravelly sand, or very gravelly loamy sand

3C horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4
 Texture - loam or clay loam

Doland Series

Depth to restrictive feature: None

Drainage class: Well drained

Permeability: Moderately slow

Landform: Till plains

Parent material: Loamy eolian material over loamy glacial till

Slope: 0 to 3 percent

Typical Pedon

Doland loam, in an area of Doland-Embsen complex, 0 to 3 percent slopes, 500 feet south and 1,200 feet east of the northwest corner of sec. 2, T. 119 N., R. 60 W.; USGS Conde, SD topographic quadrangle; lat. 45 degrees 9 minutes 7 seconds N. and long. 98 degrees 1 minute 13 seconds W.

A—0 to 7 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak fine subangular blocky structure parting to weak fine granular; slightly hard, very friable; many very fine and fine roots throughout; common very fine tubular pores; neutral; clear smooth boundary.

Bw1—7 to 15 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; slightly hard, friable; common very fine and fine roots throughout; common very fine tubular pores; neutral; clear wavy boundary.

Bw2—15 to 28 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; weak fine and medium prismatic structure parting to weak fine subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; common very fine tubular pores; neutral; clear wavy boundary.

2Bk—28 to 36 inches; light yellowish brown (2.5Y 6/3) clay loam, olive brown (2.5Y 4/3) moist; moderate medium prismatic structure parting to moderate fine subangular blocky; hard, firm, slightly sticky and slightly plastic; few very fine roots throughout; few very fine tubular pores; 25 percent calcium carbonate equivalent; common fine and medium soft masses of carbonate; 2 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.

2BCk—36 to 52 inches; light yellowish brown (2.5Y 6/3) clay loam, olive brown (2.5Y 4/3) moist; weak medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few very fine roots throughout; few very fine tubular pores; 18 percent calcium carbonate equivalent; few iron stains; few fine soft masses of carbonate and few fine soft masses of iron-manganese; few fine prominent dark yellowish brown (10YR 4/6) and few fine prominent gray (10YR 5/1) relict redox features; 2 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.

2C—52 to 80 inches; pale yellow (2.5Y 7/3) clay loam, light olive brown (2.5Y 5/3) moist; few fine prominent gray (10YR 5/1) and common fine prominent dark yellowish brown (10YR 4/6) mottles; massive; hard, firm, slightly sticky and slightly plastic; few very fine tubular pores; 16 percent calcium carbonate

equivalent; few fine soft masses of iron-manganese; 2 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches

Depth to carbonates: 18 to 28 inches

Depth to contrasting parent material: 15 to 30 inches over glacial till

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

Remarks: Some pedons lack a 2Bk or 2BCK horizon.

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1 or (2 in the lower part)

Texture - loam but is silt loam or very fine sandy loam in some pedons

Bw horizon:

Hue - 10YR or 2.5Y; value - 4 to 6 (3 to 5 moist); and chroma - 2 to 4

Texture - loam or silt loam

2Bk horizon:

Hue - 10YR or 2.5Y; value - 5 or 6 (4 or 5 moist); and chroma - 2 to 4

Texture - loam or clay loam

2C horizon:

Hue - 2.5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - loam or clay loam

Dovecreek Series

Depth to restrictive feature: None

Drainage class: Moderately well drained

Permeability: Moderate

Landform: Flood plains

Parent material: Silty alluvium

Slope: 0 to 2 percent

Typical Pedon

Dovecreek silt loam, 0 to 2 percent slopes, 2,250 feet east and 180 feet north of the southwest corner of sec. 7, T. 118 N., R. 65 W.; USGS Northville SW, SD topographic quadrangle; lat. 45 degrees 2 minutes 33 seconds N. and long. 98 degrees 42 minutes 26 seconds W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam, very dark brown (10YR 2/2) moist; weak fine granular structure; hard, friable, slightly sticky and slightly plastic; many very fine and fine roots throughout; common very fine tubular pores; neutral; abrupt smooth boundary.

A—8 to 16 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; moderate fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; many very fine and fine roots throughout; common very fine tubular pores; neutral; gradual smooth boundary.

Bw—16 to 22 inches; gray (10YR 5/1) silty clay loam, very dark gray (10YR 3/1) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; many very fine tubular pores; slightly alkaline; clear smooth boundary.

- Bk**—22 to 30 inches; grayish brown (10YR 5/2) silty clay loam, dark grayish brown (10YR 4/2) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; many very fine tubular pores; 12 percent calcium carbonate equivalent; common fine soft masses of carbonate; strongly effervescent; moderately alkaline; gradual wavy boundary.
- Ab**—30 to 37 inches; brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak coarse prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; many very fine tubular pores; 5 percent calcium carbonate equivalent; slightly effervescent; slightly alkaline; clear smooth boundary.
- Bwb**—37 to 46 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine tubular pores; 6 percent calcium carbonate equivalent; slightly effervescent; slightly alkaline; clear smooth boundary.
- Akb**—46 to 80 inches; brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine tubular pores; 8 percent calcium carbonate equivalent; common fine soft masses of carbonate; few fine prominent light brownish gray (10YR 6/2) redox depletions; strongly effervescent; moderately alkaline; gradual smooth boundary.

Range in Characteristics

Mollic epipedon thickness: Greater than 16 inches

Depth to carbonates: 0 to 50 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 50 inches

Remarks: Some pedons have a C horizon.

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1 or 2

Texture - silt loam but is loam or silty clay loam in some pedons

Bw horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 to 4 moist); and chroma - 1 or 2

Texture - silt loam or silty clay loam but is loam in some pedons

Bk horizon:

Hue - 10YR or 2.5Y; value - 3 to 6 (2 to 5 moist); and chroma - 1 to 3

Texture - silt loam or silty clay loam but is loam in some pedons

Ab, Bwb, or Akb horizon:

Hue - 10YR or 2.5Y; value - 4 to 6 (2 to 4 moist); and chroma - 1 to 3

Texture - silt loam, silty clay loam, or loam

C horizon: (if present)

Hue - 10YR or 2.5Y; value - 3 to 7 (2 to 5 moist); and chroma - 1 to 4

Texture - silt loam, silty clay loam, or silty clay

Dovray Series

Depth to restrictive feature: None

Drainage class: Very poorly drained

Permeability: Slow

Landform: Lake plains

Parent material: Clayey glaciolacustrine sediments

Slope: 0 to 1 percent

Typical Pedon

Dovray silty clay, 0 to 1 percent slopes, 2,040 feet east and 140 feet south of the northwest corner of sec. 6, T. 122 N., R. 63 W., in Brown County; USGS Aberdeen East, SD topographic quadrangle; lat. 45 degrees 24 minutes 56 second N. and long. 98 degrees 28 minutes 1 second W.

- Ap—0 to 6 inches; dark gray (10YR 4/1) silty clay, black (10YR 2/1) moist; weak medium and coarse subangular blocky structure parting to moderate fine granular; very hard, firm, sticky and plastic; many very fine and fine roots throughout; few very fine tubular pores; slightly acid; abrupt smooth boundary.
- A—6 to 16 inches; dark gray (10YR 4/1) silty clay, black (10YR 2/1) moist; weak coarse subangular blocky structure parting to moderate fine angular blocky; very hard, firm, sticky and plastic; common very fine and fine roots throughout; few very fine tubular pores; slightly acid; gradual wavy boundary.
- Bg—16 to 24 inches; gray (5Y 5/1) silty clay, very dark gray (5Y 3/1) moist; weak coarse subangular blocky structure parting to moderate very fine and fine angular blocky; very hard, firm, sticky and plastic; few very fine roots throughout; few very fine tubular pores; neutral; gradual wavy boundary.
- Bkg1—24 to 33 inches; gray (5Y 5/1) silty clay, very dark gray (5Y 3/1) moist; weak coarse subangular blocky structure parting to weak very fine subangular blocky; very hard, firm, sticky and plastic; few very fine roots throughout; few very fine tubular pores; few fine and medium soft masses of carbonate; strongly effervescent; neutral; gradual wavy boundary.
- Bkg2—33 to 40 inches; light gray (5Y 7/1) silty clay, olive gray (5Y 5/2) moist; weak coarse subangular blocky structure; very hard, firm, sticky and plastic; few very fine tubular pores; few manganese or iron-manganese stains throughout; common fine and medium soft masses of carbonate; many fine and medium distinct light olive brown (2.5Y 5/6) redox concentrations; strongly effervescent; neutral; gradual wavy boundary.
- Cg—40 to 60 inches; light gray (5Y 7/1) silty clay loam, olive gray (5Y 5/2) moist; massive; very hard, friable; few very fine tubular pores; few fine soft masses of carbonate; many fine and medium distinct light olive brown (2.5Y 5/6) and few medium prominent yellowish brown (10YR 5/8) redox concentrations; slightly effervescent; neutral.

Range in Characteristics

Mollic epipedon thickness: 24 to 54 inches

Depth to carbonates: 20 to 60 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 10 inches

Remarks: Some pedons have an ABg horizon.

A horizon:

Hue - 10YR, 2.5Y, 5Y, or neutral; value - 3 or 4 (2 or 3 moist); and chroma - 0 or 1

Texture - silty clay but is clay in some pedons

Bg or Bkg horizon:

Hue - 2.5Y or 5Y; value - 4 to 7 (3 to 6 moist); and chroma - 1 or 2

Texture - silty clay or clay but is silty clay loam or clay loam in some pedons

Cg horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 1 or 2

Texture - silty clay, clay, or silty clay loam but is clay loam in some pedons

Dudley Series

Depth to restrictive feature: Natric; top depth ranges from 7 to 17 inches

Drainage class: Moderately well drained

Permeability: Very slow

Landform: Till plains

Parent material: Loamy glacial till

Slope: 0 to 2 percent

Typical Pedon

Dudley silt loam, in an area of Dudley-Jerauld silt loams, 0 to 2 percent slopes, 420 feet north and 2,045 feet west of the southeast corner of sec. 33, T. 114 N., R. 60 W.; USGS Bloomfield, SD topographic quadrangle; lat. 44 degrees 38 minutes 0 seconds N. and long. 98 degrees 2 minutes 49 seconds W.

- A—0 to 5 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; weak fine granular structure; soft, very friable; many very fine roots throughout; common very fine tubular pores; slightly acid; abrupt smooth boundary.
- E—5 to 7 inches; gray (10YR 6/1) silt loam, very dark gray (10YR 3/1) moist; weak thin platy structure parting to weak fine granular; soft, very friable; many very fine roots throughout; many very fine tubular pores; slightly acid; abrupt smooth boundary.
- B_{tn1}—7 to 10 inches; dark gray (10YR 4/1) clay loam, very dark gray (10YR 3/1) moist; strong medium columnar structure; very hard, very firm, sticky and plastic; common very fine roots between peds; few very fine tubular pores; gray (10YR 6/1) coats on tops of columns and clay films on vertical faces of peds; neutral; clear wavy boundary.
- B_{tn2}—10 to 18 inches; dark gray (10YR 4/1) clay loam, very dark gray (10YR 3/1) moist; moderate medium prismatic structure; very hard, very firm, sticky and plastic; common very fine roots between peds; few very fine tubular pores; clay films on vertical faces of peds; moderately alkaline; clear wavy boundary.
- B_z—18 to 25 inches; dark grayish brown (2.5Y 4/2) clay loam, very dark grayish brown (2.5Y 3/2) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; very hard, firm, sticky and plastic; few very fine roots between peds; few very fine tubular pores; 3 percent calcium carbonate equivalent; common fine salt masses and few fine nests of gypsum; slightly effervescent; slightly alkaline; gradual wavy boundary.
- B_{kz}—25 to 39 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak fine and medium subangular blocky structure; very hard, firm, sticky and plastic; common very fine tubular pores; 19 percent calcium carbonate equivalent; common fine soft masses of carbonate and common fine salt masses and few fine nests of gypsum; few fine prominent dark yellowish brown (10YR 4/6) redox concentrations; 2 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C₁—39 to 62 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; very hard, firm, sticky and plastic; few very fine tubular pores; 14 percent calcium carbonate equivalent; few iron stains; few fine nests of gypsum; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations and few fine distinct gray (10YR 5/1) redox depletions; 2 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.

C2—62 to 80 inches; light gray (2.5Y 7/2) clay loam, grayish brown (2.5Y 5/2) moist; massive; very hard, firm, sticky and plastic; few very fine tubular pores; 13 percent calcium carbonate equivalent; few fine nests of gypsum; many fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine distinct gray (10YR 5/1) redox depletions; 2 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 20 to 40 inches

Depth to carbonates: 16 to 35 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: 16 to 40 inches

A horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 1 or 2

Texture - silt loam but is loam in some pedons

E horizon:

Hue - 10YR; value - 5 to 7 (3 to 5 moist); and chroma - 1 or 2

Texture - silt loam or loam

Btn horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 or 3 moist); and chroma - 1 or 2

Texture - silty clay loam, clay loam, silty clay, or clay

Bz and Bkz horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 4 to 6 (3 to 5 moist); and chroma - 2 to 4

Texture - clay loam, silty clay loam, or clay

C horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - loam or clay loam

Durrstein Series

Depth to restrictive feature: Natric; top depth ranges from 1 to 4 inches

Drainage class: Poorly drained

Permeability: Very slow

Landform: Flood plains

Parent material: Clayey alluvium

Slope: 0 to 1 percent

Typical Pedon

Durrstein silt loam, 0 to 1 percent slopes, 2,075 feet west and 150 feet north of the southeast corner of sec. 30, T. 114 N., R. 64 W.; USGS Tulare, SD topographic quadrangle; lat. 44 degrees 38 minutes 55 seconds N. and long. 98 degrees 34 minutes 20 seconds W.

E—0 to 2 inches; gray (10YR 6/1) silt loam, dark gray (10YR 4/1) moist; weak thin platy structure; soft, very friable; many very fine roots throughout; common very fine tubular pores; slightly acid; abrupt smooth boundary.

Btn1—2 to 6 inches; dark gray (10YR 4/1) silty clay, black (10YR 2/1) moist; strong medium columnar structure; very hard, very firm, sticky and plastic; common very fine roots between peds; few very fine tubular pores; gray (10YR 6/1) coats on tops of columns and clay films on vertical faces of peds; neutral; clear smooth boundary.

- Btn2—6 to 14 inches; dark gray (10YR 4/1) silty clay, black (10YR 2/1) moist; moderate fine and medium prismatic structure; very hard, very firm, sticky and plastic; common very fine roots between peds; few very fine tubular pores; clay films on vertical faces of peds; neutral; clear smooth boundary.
- Bkzg1—14 to 25 inches; gray (2.5Y 5/1) silty clay, very dark gray (2.5Y 3/1) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; hard, firm, sticky and plastic; few very fine roots throughout; few very fine tubular pores; 8 percent calcium carbonate equivalent; common fine soft masses of carbonate and common fine salt masses and few fine gypsum crystals; strongly effervescent; moderately alkaline; clear smooth boundary.
- Bkzg2—25 to 32 inches; gray (5Y 5/1) silty clay, dark gray (5Y 4/1) moist; weak fine and medium subangular blocky structure; hard, firm, sticky and plastic; common very fine tubular pores; 14 percent calcium carbonate equivalent; common fine soft masses of carbonate and common fine salt masses and few fine gypsum crystals; few fine prominent dark grayish brown (10YR 4/2) redox concentrations; strongly effervescent; moderately alkaline; gradual wavy boundary.
- Bkzg3—32 to 43 inches; gray (5Y 5/1) silty clay loam, dark gray (5Y 4/1) moist; weak fine and medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; common very fine tubular pores; 8 percent calcium carbonate equivalent; many fine and medium soft masses of carbonate and common fine salt masses and few fine gypsum crystals; few fine prominent dark yellowish brown (10YR 4/4) redox concentrations; strongly effervescent; moderately alkaline; clear smooth boundary.
- Ab—43 to 48 inches; dark gray (2.5Y 4/1) silty clay loam, black (2.5Y 2.5/1) moist; weak fine subangular blocky structure; hard, firm, slightly sticky and slightly plastic; common very fine tubular pores; 5 percent calcium carbonate equivalent; few fine soft masses of carbonate and few fine salt masses and few fine gypsum crystals; few fine prominent dark yellowish brown (10YR 4/4) redox concentrations; strongly effervescent; moderately alkaline; clear smooth boundary.
- Cg—48 to 80 inches; gray (5Y 6/1) silty clay loam, dark gray (5Y 4/1) moist; massive; hard, firm, slightly sticky and slightly plastic; common very fine tubular pores; 18 percent calcium carbonate equivalent; few fine soft masses of carbonate; few fine distinct gray (10YR 5/1) redox depletions; strongly effervescent; strongly alkaline.

Range in Characteristics

Mollic epipedon thickness: 15 to 30 inches

Depth to carbonates: 5 to 15 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: 5 to 15 inches

Remarks: Some pedons have a Bzg horizon.

E horizon:

Hue - 10YR; value - 5 or 6 (3 or 4 moist); and chroma - 1 or 2

Texture - silt loam but is loam in some pedons

Btn horizon:

Hue - 10YR or 2.5Y; value - 3 to 6 (2 or 3 moist); and chroma - 1 or 2

Texture - clay, clay loam, or silty clay

Bkzg horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 5 or 6 (2 to 5 moist); and chroma - 1 or 2

Texture - silty clay, clay loam, silty clay loam, or clay

Cg horizon:

Hue - 2.5Y or 5Y; value - 4 to 7 (3 to 6 moist); and chroma - 1 or 2
Texture - clay, silty clay, clay loam, or silty clay loam

Eckman Series

Depth to restrictive feature: None

Drainage class: Well drained

Permeability: Moderate

Landform: Lake plains

Parent material: Silty and loamy glaciolacustrine sediments

Slope: 0 to 6 percent

Typical Pedon

Eckman very fine sandy loam, in an area of Eckman-Zell very fine sandy loams, 2 to 6 percent slopes, 340 feet west and 990 feet north of the southeast corner of sec. 19, T. 120 N., R. 62 W.; USGS Randolph, SD topographic quadrangle; lat. 45 degrees 12 minutes 58 seconds N. and long. 98 degrees 14 minutes 53 seconds W.

- Ap—0 to 7 inches; dark gray (10YR 4/1) very fine sandy loam, black (10YR 2/1) moist; weak fine subangular blocky structure parting to weak medium granular; soft, very friable; common very fine roots throughout; common very fine tubular pores; neutral; abrupt smooth boundary.
- Bw1—7 to 12 inches; dark grayish brown (10YR 4/2) very fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak coarse prismatic structure parting to weak fine and medium subangular blocky; soft, very friable; few very fine roots throughout; common very fine tubular pores; neutral; clear wavy boundary.
- Bw2—12 to 17 inches; grayish brown (10YR 5/2) very fine sandy loam, dark grayish brown (10YR 4/2) moist; weak coarse prismatic structure parting to weak fine and medium subangular blocky; soft, very friable; few very fine roots throughout; common very fine tubular pores; slightly alkaline; clear wavy boundary.
- Bk1—17 to 31 inches; light yellowish brown (2.5Y 6/3) very fine sandy loam, light olive brown (2.5Y 5/3) moist; weak coarse prismatic structure parting to weak fine and medium subangular blocky; soft, very friable; few very fine roots throughout; common very fine tubular pores; 12 percent calcium carbonate equivalent; strongly effervescent; moderately alkaline; gradual wavy boundary.
- Bk2—31 to 39 inches; light yellowish brown (2.5Y 6/3) very fine sandy loam, light olive brown (2.5Y 5/3) moist; weak fine and medium subangular blocky structure; soft, very friable; few very fine tubular pores; 14 percent calcium carbonate equivalent; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C1—39 to 60 inches; pale yellow (2.5Y 7/3) very fine sandy loam, light olive brown (2.5Y 5/3) moist; massive; soft, very friable; few very fine tubular pores; 10 percent calcium carbonate equivalent; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C2—60 to 80 inches; pale yellow (2.5Y 7/3) very fine sandy loam, light olive brown (2.5Y 5/3) moist; massive; soft, very friable; few very fine tubular pores; 8 percent calcium carbonate equivalent; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches

Depth to carbonates: 10 to 36 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 1 or 2 (1 moist)

Texture - very fine sandy loam but is silt loam or loam in some pedons

Bw horizon:

Hue - 10YR or 2.5Y; value - 4 to 6 (3 to 5 moist); and chroma - 2 to 4

Texture - silt loam, loam, or very fine sandy loam

Bk horizon:

Hue - 10YR or 2.5Y; value - 6 to 8 (5 or 6 moist); and chroma - 2 to 4

Texture - silt loam, very fine sandy loam, or loam

C horizon:

Hue - 10YR or 2.5Y; value - 6 to 8 (5 or 6 moist); and chroma - 2 to 4

Texture - silt loam, very fine sandy loam, or loam but is very fine sand or fine sandy loam in some pedons

Edgeley Series

Depth to restrictive feature: Bedrock (paralitic); top depth ranges from 20 to 40

Drainage class: Well drained

Permeability: Moderate in the loamy sediments and very slow in underlying soft shale bedrock

Landform: Moraines

Parent material: Loamy glacial till over soft shale bedrock

Slope: 2 to 20 percent

Typical Pedon

Edgeley loam, 6 to 9 percent slopes, 1,650 feet south and 600 feet west of the northeast corner of sec. 31, T. 117 N., R. 62 W.; USGS Frankfort, SD topographic quadrangle; lat. 44 degrees 54 minutes 19 seconds N. and long. 98 degrees 19 minutes 53 seconds W.

A—0 to 8 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots throughout; few very fine tubular pores; neutral; clear smooth boundary.

Bw—8 to 18 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; few very fine tubular pores; neutral; clear smooth boundary.

Bk—18 to 25 inches; light olive brown (2.5Y 5/3) clay loam, olive brown (2.5Y 4/3) moist; weak fine and medium subangular blocky structure; hard, firm, sticky and plastic; few very fine roots throughout; few very fine tubular pores; 12 percent calcium carbonate equivalent; common fine soft masses of carbonate; 2 percent pebbles; strongly effervescent; moderately alkaline; abrupt smooth boundary.

2Cr—25 to 80 inches; gray (5Y 6/1) soft shale bedrock, dark gray (5Y 4/1) moist; massive; 7 percent calcium carbonate equivalent; slightly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches

Depth to carbonates: 16 to 24 inches

Depth to contrasting parent material: 20 to 40 inches over shale bedrock

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR or 2.5Y; value - 3 or 4 (2 or 3 moist); and chroma - 1

Texture - loam but is clay loam in some pedons

Bw or Bk horizon:

Hue - 10YR or 2.5Y; value - 4 to 6 (2 to 4 moist); and chroma - 1 to 3

Texture - loam or clay loam

2Cr horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (3 to 5 moist); and chroma - 1 to 3

Texture - soft shale bedrock

Egeland Series

Depth to restrictive feature: None

Drainage class: Well drained

Permeability: Moderately rapid

Landform: Outwash plains

Parent material: Loamy glaciofluvial sediments

Slope: 0 to 9 percent

Typical Pedon

Egeland sandy loam, in an area of Egeland-Embsen complex, 0 to 2 percent slopes, 1,200 feet west and 2,370 feet north of the southeast corner of sec. 1, T. 119 N., R. 61 W.; USGS Conde, SD topographic quadrangle; lat. 45 degrees 8 minutes 45 seconds N. and long. 98 degrees 6 minutes 30 seconds W.

Ap—0 to 8 inches; dark gray (10YR 4/1) sandy loam, black (10YR 2/1) moist; weak fine granular structure; slightly hard, very friable; many very fine roots throughout; few very fine tubular pores; neutral; abrupt smooth boundary.

Bw1—8 to 14 inches; dark grayish brown (10YR 4/2) sandy loam, very dark brown (10YR 2/2) moist; weak fine and medium subangular blocky structure; slightly hard, very friable; common very fine roots throughout; few very fine tubular pores; neutral; clear smooth boundary.

Bw2—14 to 31 inches; grayish brown (10YR 5/2) sandy loam, dark grayish brown (10YR 4/2) moist; weak fine subangular blocky structure; soft, very friable; few very fine roots throughout; few very fine tubular pores; slightly alkaline; clear smooth boundary.

Bk—31 to 46 inches; pale brown (10YR 6/3) loamy sand, brown (10YR 4/3) moist; single grain; loose; 11 percent calcium carbonate equivalent; strongly effervescent; slightly alkaline; clear wavy boundary.

C1—46 to 64 inches; brown (10YR 5/3) loamy sand, brown (10YR 4/3) moist; single grain; loose; 4 percent calcium carbonate equivalent; slightly effervescent; moderately alkaline; gradual wavy boundary.

C2—64 to 80 inches; light brownish gray (2.5Y 6/2) sandy loam, dark grayish brown (2.5Y 4/2) moist; single grain; slightly hard, very friable; 6 percent calcium carbonate equivalent; few fine prominent dark yellowish brown (10YR 4/4) redox concentrations; slightly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 8 to 16 inches

Depth to carbonates: 14 to 45 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1

Texture - sandy loam but is fine sandy loam or loam in some pedons

Bw horizon:

Hue - 10YR or 2.5Y; value - 4 to 6 (2 to 5 moist); and chroma - 1 to 4

Texture - sandy loam or fine sandy loam but is loamy sand or loamy fine sand in some pedons

Bk horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (4 or 5 moist); and chroma - 2 to 4

Texture - loamy sand or loamy fine sand but is sandy loam, fine sandy loam, or loamy very fine sand in some pedons

C horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (4 or 5 moist); and chroma - 2 to 4

Texture - loamy sand, loamy fine sand, or sandy loam but is loamy very fine sand, very fine sandy loam, or fine sandy loam in some pedons

Els Series

Depth to restrictive feature: None

Drainage class: Somewhat poorly drained

Permeability: Rapid in the sandy sediments and moderately slow in the underlying glacial till

Landform: Till plains

Parent material: Sandy glaciofluvial sediments over loamy glacial till

Slope: 0 to 2 percent

Typical Pedon

Els fine sand, in an area of Ipage-Els-Shue complex, 0 to 6 percent slopes, 2,400 feet south and 1,000 feet west of the northeast corner of sec. 20, T. 114 N., R. 63 W.; USGS Hitchcock, SD topographic quadrangle; lat. 44 degrees 40 minutes 9 seconds N. and long. 98 degrees 25 minutes 35 seconds W.

A—0 to 7 inches; dark gray (10YR 4/1) fine sand, very dark gray (10YR 3/1) moist; weak fine granular structure; soft, very friable; many very fine roots throughout; neutral; clear smooth boundary.

AC—7 to 15 inches; grayish brown (10YR 5/2) fine sand, dark grayish brown (10YR 4/2) moist; weak fine subangular blocky structure; soft, very friable; common very fine roots throughout; less than 0.6 percent organic carbon; neutral; clear wavy boundary.

C1—15 to 27 inches; light brownish gray (2.5Y 6/2) fine sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose; few very fine roots throughout; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations; neutral; gradual wavy boundary.

C2—27 to 41 inches; light brownish gray (2.5Y 6/2) fine sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose; few very fine roots throughout; many fine

and medium prominent dark yellowish brown (10YR 4/6) redox concentrations; neutral; clear wavy boundary.

Ab—41 to 49 inches; dark gray (2.5Y 4/1) loamy fine sand, very dark gray (2.5Y 3/1) moist; weak fine subangular blocky structure; soft, very friable; few fine soft masses of iron-manganese; common fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations; neutral; clear wavy boundary.

2Cg1—49 to 65 inches; pale yellow (2.5Y 7/3) clay loam, light olive brown (2.5Y 5/3) moist; massive; very hard, firm, sticky and plastic; few very fine tubular pores; 10 percent calcium carbonate equivalent; few fine soft masses of carbonate and common fine soft masses of iron-manganese; many fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine and medium prominent gray (10YR 6/1) redox depletions; strongly effervescent; 1 percent pebbles; slightly alkaline; gradual wavy boundary.

2Cg2—65 to 80 inches; light gray (2.5Y 7/2) clay loam, grayish brown (2.5Y 5/2) moist; massive; very hard, firm, sticky and plastic; few very fine tubular pores; 9 percent calcium carbonate equivalent; few fine soft masses of carbonate and common fine soft masses of iron-manganese; common fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations and many fine and medium distinct gray (10YR 6/1) redox depletions; 1 percent pebbles; strongly effervescent; slightly alkaline.

Range in Characteristics

Depth to carbonates: 40 to 60 inches

Depth to contrasting parent material: Greater than 40 inches over glacial till

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

Remarks: Some pedons lack an Ab horizon.

A horizon:

Hue - 10YR; value - 4 or 5 (3 or 4 moist); and chroma - 1 or 2

Texture - fine sand but is sand, loamy sand, or loamy fine sand in some pedons

AC horizon:

Hue - 10YR or 2.5Y; value - 5 or 6 (4 or 5 moist); and chroma - 1 to 3

Texture - fine sand, sand, loamy sand, and loamy fine sand

C horizon:

Hue - 10YR or 2.5Y; value - 5 to 8 (4 to 7 moist); and chroma - 2 or 3

Texture - fine sand, sand, loamy sand, or loamy fine sand

2C horizon:

Hue - 10YR or 2.5Y; value - 5 to 8 (4 to 7 moist); and chroma - 2 or 3

Texture - clay loam or loam

Elsmere Series

Depth to restrictive feature: None

Drainage class: Somewhat poorly drained

Permeability: Rapid in the sandy sediments and moderately slow in the underlying glacial till

Landform: Till plains and outwash plains

Parent material: Sandy glaciofluvial sediments over loamy glacial till

Slope: 0 to 2 percent

Typical Pedon

Elsmere loamy sand, in an area of Forestburg-Elsmere loamy sands, 0 to 2 percent slopes, 2,250 feet south and 275 feet west of the northeast corner of sec. 2, T. 114 N., R. 64 W.; USGS Hitchcock, SD topographic quadrangle; lat. 44 degrees 42 minutes 49 seconds N. and long. 98 degrees 29 minutes 2 seconds W.

- Ap—0 to 8 inches; dark gray (10YR 4/1) loamy sand, black (10YR 2/1) moist; weak fine granular structure; soft, very friable; common very fine roots throughout; few very fine tubular pores; neutral; abrupt smooth boundary.
- A—8 to 19 inches; dark gray (10YR 4/1) loamy sand, black (10YR 2/1) moist; weak fine and medium subangular blocky structure; soft, very friable; few very fine roots throughout; few very fine tubular pores; neutral; clear smooth boundary.
- AC—19 to 29 inches; grayish brown (10YR 5/2) loamy sand, very dark grayish brown (10YR 3/2) moist; single grain; loose; few very fine roots throughout; few very fine tubular pores; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations; neutral; clear wavy boundary.
- C1—29 to 46 inches; pale brown (10YR 6/3) loamy sand, brown (10YR 4/3) moist; single grain; loose; few very fine tubular pores; common fine and medium soft masses of iron-manganese; many fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations; neutral; clear wavy boundary.
- 2C2—46 to 54 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; very hard, firm, slightly sticky and slightly plastic; few very fine tubular pores; 12 percent calcium carbonate equivalent; few fine and medium soft masses of carbonate and common fine and medium soft masses of iron-manganese; common fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine and medium prominent gray (10YR 5/1) redox depletions; 2 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
- 2C3—54 to 80 inches; light gray (2.5Y 7/2) clay loam, grayish brown (2.5Y 5/2) moist; massive; very hard, firm, slightly sticky and slightly plastic; few very fine tubular pores; 9 percent calcium carbonate equivalent; common fine and medium soft masses of iron-manganese; common fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine and medium distinct gray (10YR 5/1) redox depletions; 2 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 10 to 20 inches

Depth to carbonates: 30 to 50 inches

Depth to contrasting parent material: Greater than 40 inches over glacial till

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 1 or 2

Texture - loamy sand but is loamy fine sand, fine sandy loam, or sandy loam in some pedons

AC horizon:

Hue - 10YR or 2.5Y; value - 4 to 6 (2 to 4 moist); and chroma - 1 to 3

Texture - loamy sand or loamy fine sand but is fine sand or sand in some pedons

C horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 or 3

Texture - loamy sand, loamy fine sand, or fine sand but is sand in some pedons

2C horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 or 3
Texture - clay loam or loam but is fine sandy loam in some pedons

Embden Series

Depth to restrictive feature: None

Drainage class: Moderately well drained

Permeability: Moderately rapid

Landform: Outwash plains

Parent material: Loamy glaciofluvial sediments

Slope: 0 to 6 percent

Typical Pedon

Embden fine sandy loam, in an area of Egeland-Embden complex, 0 to 2 percent slopes, 375 feet north and 150 feet east of the southwest corner of sec. 6, T. 119 N., R. 60 W.; USGS Conde, SD topographic quadrangle; lat. 45 degrees 8 minutes 25 seconds N. and long. 98 degrees 6 minutes 13 seconds W.

- Ap—0 to 7 inches; dark gray (10YR 4/1) fine sandy loam, black (10YR 2/1) moist; weak fine granular structure; slightly hard, very friable; many very fine and fine roots throughout; common very fine tubular pores; slightly alkaline; abrupt smooth boundary.
- A—7 to 15 inches; dark gray (10YR 4/1) fine sandy loam, black (10YR 2/1) moist; weak fine subangular blocky structure; slightly hard, very friable; common very fine and fine roots throughout; common very fine tubular pores; slightly alkaline; clear smooth boundary.
- Bw1—15 to 20 inches; gray (10YR 5/1) fine sandy loam, very dark gray (10YR 3/1) moist; weak fine and medium subangular blocky structure; soft, very friable; common very fine roots throughout; few very fine tubular pores; slightly alkaline; gradual wavy boundary.
- Bw2—20 to 27 inches; grayish brown (10YR 5/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; soft, very friable; few very fine roots throughout; few very fine tubular pores; moderately alkaline; gradual wavy boundary.
- Bw3—27 to 38 inches; light olive brown (2.5Y 5/3) sandy loam, dark olive brown (2.5Y 3/3) moist; weak fine subangular blocky structure; soft, very friable; few very fine roots throughout; few very fine tubular pores; 1 percent gravel; moderately alkaline; gradual wavy boundary.
- Bk—38 to 52 inches; light brownish gray (2.5Y 6/2) loamy sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose; 11 percent calcium carbonate equivalent; 5 percent gravel; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C—52 to 80 inches; light gray (2.5Y 7/2) sand, grayish brown (2.5Y 5/2) moist; single grain; loose; 8 percent calcium carbonate equivalent; 5 percent gravel; slightly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 to 40 inches

Depth to carbonates: 20 to 60 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1

Texture - fine sandy loam but is sandy loam, very fine sandy loam, or loam in some pedons

Bw horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 to 4 moist); and chroma - 1 to 4

Texture - fine sandy loam, loam, sandy loam, or very fine sandy loam

Bk horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 4 to 8 (3 to 6 moist); and chroma - 1 to 4

Texture - fine sandy loam, sandy loam, loamy fine sand, very fine sandy loam, or loamy sand

C horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 1 to 4

Texture - fine sandy loam, sandy loam, loamy fine sand, very fine sandy loam, or sand

Enet Series

Depth to restrictive feature: Strongly contrasting textural stratification; top depth ranges from 20 to 40 inches

Drainage class: Well drained

Permeability: Moderate in the loamy sediments and very rapid in the underlying gravelly material

Landform: Outwash plains

Parent material: Loamy alluvium over glacial outwash

Slope: 0 to 2 percent

Typical Pedon

Enet loam, in an area of Delmont-Enet loams, 0 to 2 percent slopes, 540 feet west and 120 feet south of the northeast corner of sec. 23, T. 115 N., R. 64 W.; USGS Frankfort, SD topographic quadrangle; lat. 44 degrees 45 minutes 48 seconds N. and long. 98 degrees 29 minutes 7 seconds W.

Ap—0 to 7 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak fine and medium subangular blocky structure parting to moderate fine granular; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots throughout; few very fine tubular pores; neutral; abrupt smooth boundary.

Bw1—7 to 15 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; moderate medium and coarse subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots throughout; few very fine tubular pores; neutral; clear smooth boundary.

Bw2—15 to 28 inches; brown (10YR 4/3) loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots throughout; few very fine tubular pores; slightly alkaline; clear smooth boundary.

2Bk—28 to 35 inches; light olive brown (2.5Y 5/3) gravelly loamy sand, olive brown (2.5Y 4/3) moist; single grain; loose; few very fine roots throughout; few carbonate coats on sand and gravel; strongly effervescent; 20 percent gravel; moderately alkaline; gradual wavy boundary.

2C—35 to 80 inches; light olive brown (2.5Y 5/3) very gravelly loamy sand, olive brown (2.5Y 4/3) moist; single grain; loose; few carbonate coats on sand and gravel; 45 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 20 to 40 inches

Depth to carbonates: 20 to 40 inches

Depth to contrasting parent material: 20 to 40 inches over gravelly material

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

Remarks: Some pedons do not have a 2Bk horizon.

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1 or 2

Texture - loam but is fine sandy loam in some pedons

Bw horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 1 to 3

Texture - loam but is clay loam in some pedons

2Bk or 2C horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - gravelly loamy sand, gravelly sand, very gravelly loamy sand, or very gravelly sand

Ethan Series

Depth to restrictive feature: None

Drainage class: Well drained

Permeability: Moderately slow

Landform: Till plains and moraines

Parent material: Loamy glacial till

Slope: 2 to 40 percent

Typical Pedon

Ethan loam (fig. 19), in an area of Houdek-Ethan-Prosper loams, 1 to 6 percent slopes, 365 feet east and 1,100 feet north of the southwest corner of sec. 13, T. 114 N., R. 60 W.; USGS Carpenter, SD topographic quadrangle; lat. 44 degrees 40 minutes 40 seconds N. and long. 97 degrees 59 minutes 43 seconds W.

Ap—0 to 8 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; slightly hard, friable; common very fine roots throughout; common very fine tubular pores; 9 percent calcium carbonate equivalent; strongly effervescent; 1 percent pebbles; moderately alkaline; abrupt smooth boundary.

Bk1—8 to 20 inches; light yellowish brown (2.5Y 6/3) clay loam, olive brown (2.5Y 4/3) moist; weak medium prismatic structure; hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine and fine tubular pores; 24 percent calcium carbonate equivalent; common fine and medium soft masses of carbonate; 1 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bk2—20 to 35 inches; pale yellow (2.5Y 7/4) clay loam, light olive brown (2.5Y 5/4) moist; weak fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine and fine tubular pores; 16 percent calcium carbonate equivalent; common fine soft masses of carbonate; 1 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.

C1—35 to 68 inches; light yellowish brown (2.5Y 6/3) clay loam, olive brown (2.5Y 4/3) moist; massive; hard, friable, slightly sticky and slightly plastic; few

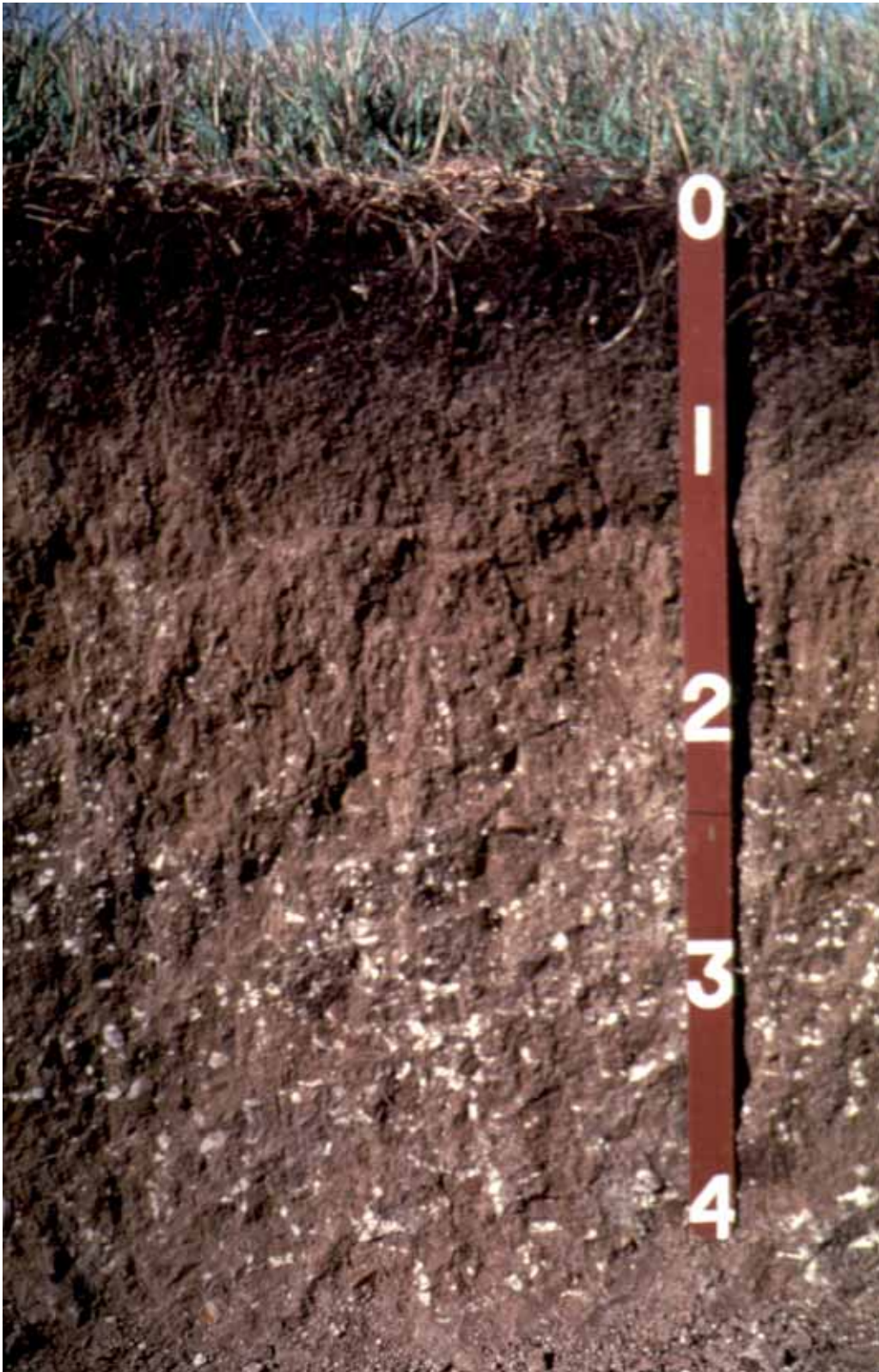


Figure 19. Profile of Ethan loam. Calcium carbonate is at a depth of about 8 inches. Depth is marked in feet.

very fine tubular pores; 10 percent calcium carbonate equivalent; few iron stains; few fine prominent dark yellowish brown (10YR 4/6) relict redox features; 3 percent pebbles; strongly effervescent; strongly alkaline; gradual wavy boundary.

C2—68 to 80 inches; pale yellow (2.5Y 7/3) clay loam, light olive brown (2.5Y 5/3) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; 10 percent calcium carbonate equivalent; common fine prominent dark yellowish brown (10YR 4/6) relict redox features; 3 percent pebbles; strongly effervescent; strongly alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 10 inches

Depth to carbonates: 0 to 5 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 40 inches

A horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 or 3 moist); and chroma - 2 or 3

Texture - loam but is clay loam or fine sandy loam in some pedons

Bk horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (3 to 6 moist); and chroma - 2 to 4

Texture - loam or clay loam

C horizon:

Hue - 2.5Y or 5Y; value - 5 to 8 (4 to 6 moist); and chroma - 2 to 4

Texture - loam or clay loam but is fine sandy loam in some pedons

Exline Series

Depth to restrictive feature: Natric; top depth ranges from 0 to 6 inches

Drainage class: Moderately well and somewhat poorly drained

Permeability: Very slow

Landform: Lake plains

Parent material: Clayey glaciolacustrine sediments over loamy glacial till

Slope: 0 to 3 percent

Typical Pedon

Exline silt loam (fig. 20), in an area of Exline-Aberdeen-Nahon silt loams, 0 to 2 percent slopes, 1,500 feet west and 300 feet north of the southeast corner of sec. 17, T. 117 N., R. 63 W.; USGS Ashton, SD topographic quadrangle; lat. 45 degrees 56 minutes 22 seconds N. and long. 98 degrees 25 minutes 56 seconds W.

E—0 to 2 inches; gray (10YR 6/1) silt loam, dark gray (10YR 4/1) moist; weak thin platy structure; slightly hard, very friable; common very fine and fine roots throughout; common very fine tubular pores; neutral; abrupt smooth boundary.

Btn1—2 to 5 inches; dark gray (10YR 4/1) silty clay, black (10YR 2/1) moist; strong medium and coarse columnar structure; very hard, very firm, very sticky and very plastic; common very fine and fine roots between peds; few very fine tubular pores; gray (10YR 6/1) coats on tops of columns and clay films on vertical faces of peds; slightly alkaline; clear wavy boundary.

Btn2—5 to 12 inches; dark gray (10YR 4/1) silty clay, black (10YR 2/1) moist; moderate medium prismatic structure parting to moderate fine and medium angular blocky; very hard, very firm, very sticky and very plastic; common very

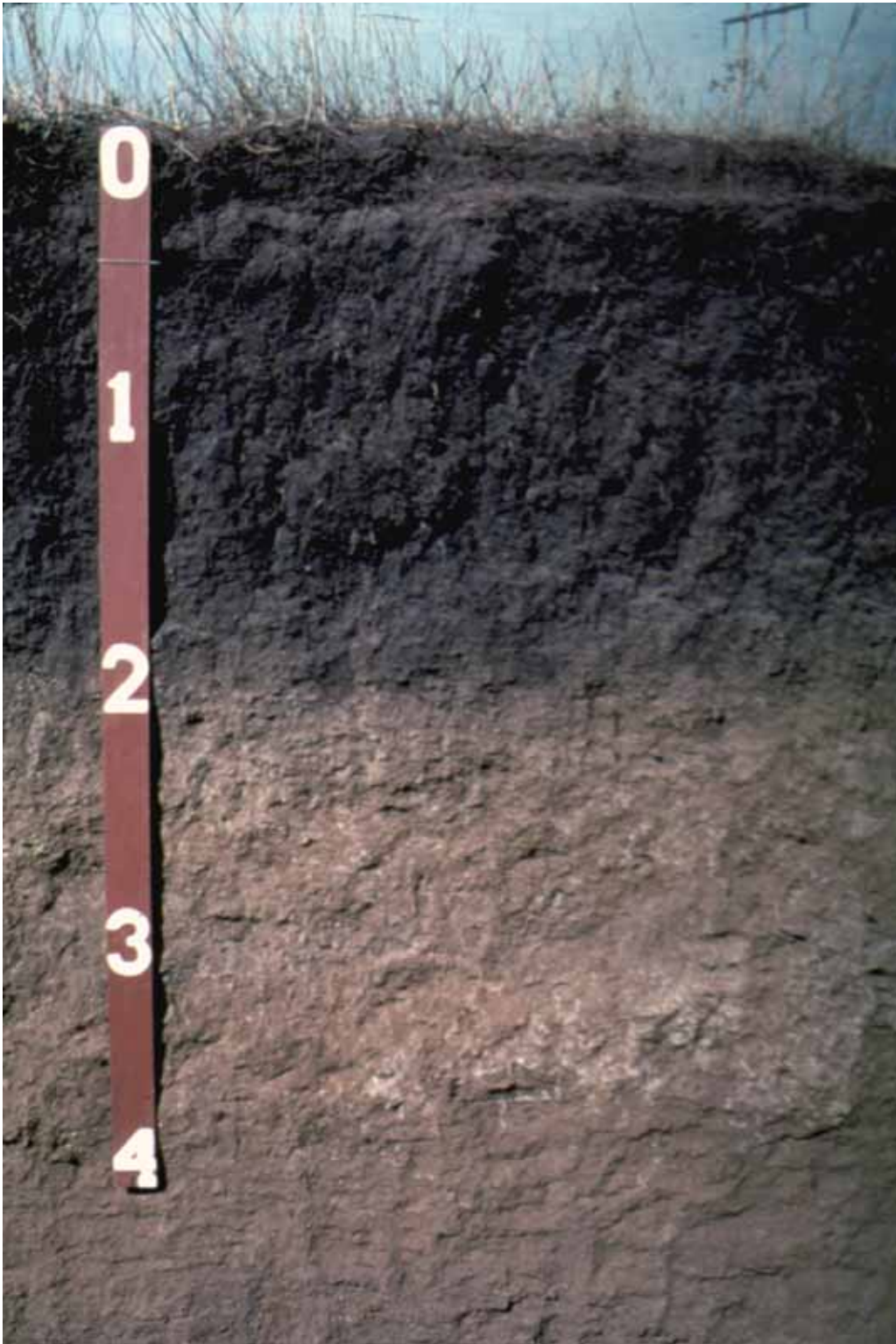


Figure 20. Profile of Exline silt loam. This soil has a claypan starting at about 3 inches. Depth is marked in feet.

fine and fine roots between peds; few very fine tubular pores; clay films on vertical faces of peds; moderately alkaline; clear wavy boundary.

Btnz—12 to 21 inches; grayish brown (10YR 5/2) silty clay, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; very hard, very firm, very sticky and very plastic; few very fine roots between peds; few very fine tubular pores; clay films on vertical faces of peds; common fine salt masses and few fine nests of gypsum; moderately alkaline; clear wavy boundary.

Bkz—21 to 29 inches; light brownish gray (2.5Y 6/2) silty clay loam, grayish brown (2.5Y 5/2) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; hard, firm, sticky and plastic; common very fine tubular pores; 18 percent calcium carbonate equivalent; common fine salt masses and few fine nests of gypsum; strongly effervescent; strongly alkaline; gradual wavy boundary.

Bk—29 to 40 inches; light brownish gray (2.5Y 6/2) silty clay loam, grayish brown (2.5Y 5/2) moist; weak fine and medium subangular blocky structure; hard, firm, sticky and plastic; common very fine tubular pores; 20 percent calcium carbonate equivalent; strongly effervescent; strongly alkaline; gradual wavy boundary.

C1—40 to 56 inches; light gray (2.5Y 7/2) silt loam, light olive brown (2.5Y 5/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine tubular pores; varved with very fine sand to clay; 14 percent calcium carbonate equivalent; few fine prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; strongly alkaline; gradual wavy boundary.

C2—56 to 80 inches; pale yellow (2.5Y 7/4) silt loam, light olive brown (2.5Y 5/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; few very fine tubular pores; varved with very fine sand to clay; 11 percent calcium carbonate equivalent; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; strongly alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 to 28 inches

Depth to carbonates: 8 to 28 inches

Depth to contrasting parent material: Greater than 40 inches over glacial till

Depth to gypsum and other visible salts other than carbonates: 6 to 16 inches

Remarks: Some pedons have an A horizon.

E horizon:

Hue - 10YR; value - 5 or 6 (3 to 5 moist); and chroma - 1

Texture - silt loam but is silty clay loam in some pedons

Btn horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 to 4 moist); and chroma - 1 or 2

Texture - silty clay, clay, or silty clay loam

Btnz horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 to 4 moist); and chroma - 1 or 2

Texture - silty clay, clay, or silty clay loam

Bk or Bkz horizon:

Hue - 10YR or 2.5Y; value - 4 to 7 (3 to 6 moist); and chroma - 1 to 3

Texture - silty clay, clay, or silty clay loam

C horizon:

Hue - 2.5Y or 5Y; value - 5 to 8 (3 to 7 moist); and chroma - 2 to 4

Texture - silt loam or silty clay loam and typically is varved with very fine sand to clay in the lower part

2C horizon:

Hue - 2.5Y or 5Y; value - 5 to 8 (3 to 7 moist); and chroma - 2 to 4

Texture - clay loam or loam

Farmsworth Series

Depth to restrictive feature: Natric; top depth ranges from 5 to 12 inches

Drainage class: Somewhat poorly drained

Permeability: Very slow

Landform: Flood plains

Parent material: Clayey alluvium

Slope: 0 to 2 percent

Typical Pedon

Farmsworth silt loam, in an area of Farmsworth-Durrstein silt loams, 0 to 2 percent slopes, 1,300 feet north and 650 feet east of the southwest corner of sec. 23, T. 114 N., R. 61 W.; lat. 44 degrees 39 minutes 53 seconds N and long. 98 degrees 8 minutes 11 seconds W.

Ap—0 to 5 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; weak fine and medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; common very fine tubular pores; slightly acid; clear smooth boundary.

E—5 to 8 inches; gray (10YR 5/1) silt loam, very dark gray (10YR 3/1) moist; weak thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; common very fine tubular pores; slightly acid; clear smooth boundary.

Btn1—8 to 12 inches; dark gray (10YR 4/1) silty clay loam, black (10YR 2/1) moist; moderate medium columnar structure; very hard, very firm, very sticky and very plastic; common very fine roots between peds; few very fine tubular pores; gray (10YR 5/1) dry, coats on tops of columns and clay films on vertical faces of peds; moderately alkaline; clear smooth boundary.

Btn2—12 to 19 inches; dark gray (10YR 4/1) silty clay, black (10YR 2/1) moist; moderate medium prismatic structure parting to moderate fine and medium angular blocky; very hard, very firm, very sticky and very plastic; common very fine roots between peds; few very fine tubular pores; clay films on vertical faces of peds; moderately alkaline; clear wavy boundary.

Btny—19 to 25 inches; dark gray (10YR 4/1) silty clay loam, black (10YR 2/1) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; very hard, firm, sticky and plastic; few very fine roots between peds; few very fine tubular pores; common fine and medium nests of gypsum and few fine salt masses; slightly alkaline; clear wavy boundary.

Bky—25 to 43 inches; gray (2.5Y 5/1) silty clay loam, very dark gray (2.5Y 3/1) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; hard, friable, sticky and plastic; few very fine roots throughout; few very fine tubular pores; 5 percent calcium carbonate equivalent; common fine soft masses of carbonate and common fine and medium nests of gypsum and few fine salt masses; strongly effervescent; moderately alkaline; clear wavy boundary.

Akb—43 to 52 inches; dark gray (2.5Y 4/1) silty clay loam, black (2.5Y 2.5/1) moist; weak fine and medium subangular blocky structure; hard, friable, sticky and plastic; few very fine tubular pores; 19 percent calcium carbonate equivalent; common fine and medium soft masses of carbonate; strongly effervescent; moderately alkaline; clear wavy boundary.

Cg—52 to 80 inches; gray (2.5Y 6/1) clay loam, dark gray (2.5Y 4/1) moist; massive; hard, friable, sticky and plastic; few very fine tubular pores; 11 percent calcium carbonate equivalent; few fine and medium soft masses of carbonate; common fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine distinct gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 20 to 60 inches

Depth to carbonates: 10 to 40 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: 16 to 35 inches

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1

Texture - silt loam but is loam, clay loam, or silty clay loam in some pedons

E horizon:

Hue - 10YR; value - 5 to 7 (3 to 5 moist); and chroma - 1 or 2

Texture - loam, clay loam, silt loam, or silty clay loam

Btn horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 to 4 moist); and chroma - 1 or 2

Texture - clay loam, clay, silty clay loam, or silty clay

Bkz or Bky horizon:

Hue - 10YR or 2.5Y; value - 4 to 6 (3 to 5 moist); and chroma - 1 to 3

Texture - silty clay loam or silty clay but is clay loam or clay in some pedons

C horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (3 to 5 moist); and chroma - 1 to 4

Texture - clay loam, clay, silty clay loam, or silty clay

Ferney Series

Depth to restrictive feature: Natric; top depth ranges from 0 to 6 inches

Drainage class: Moderately well and somewhat poorly drained

Permeability: Very slow

Landform: Till plains

Parent material: Loamy glacial till

Slope: 0 to 2 percent

Typical Pedon

Ferney loam, in an area of Cavour-Ferney loams, 0 to 2 percent slopes, 2,300 feet west and 600 feet north of the southeast corner of sec. 21, T. 117 N., R. 60 W.; USGS Doland, SD topographic quadrangle; lat. 44 degrees 55 minutes 24 seconds N. and long. 98 degrees 3 minutes 8 seconds W.

E—0 to 3 inches; gray (10YR 6/1) loam, dark gray (10YR 4/1) moist; weak thin platy structure; slightly hard, very friable; many very fine and fine roots throughout; common very fine tubular pores; neutral; abrupt smooth boundary.

- Btn1**—3 to 6 inches; dark gray (10YR 4/1) clay, black (10YR 2/1) moist; moderate medium columnar structure parting to moderate fine and medium angular blocky; very hard, very firm, very sticky and very plastic; common very fine roots between peds; few very fine tubular pores; gray (10YR 6/1) dry, coats on tops of columns and clay films on vertical faces of peds; moderately alkaline; clear smooth boundary.
- Btn2**—6 to 10 inches; dark gray (10YR 4/1) clay, black (10YR 2/1) moist; moderate medium prismatic structure parting to moderate fine and medium angular blocky; very hard, very firm, very sticky and very plastic; common very fine roots between peds; few very fine tubular pores; clay films on vertical faces of peds; moderately alkaline; gradual wavy boundary.
- Btnz**—10 to 16 inches; dark grayish brown (10YR 4/2) clay, very dark brown (10YR 2/2) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; very hard, very firm, very sticky and very plastic; common very fine roots between peds; few very fine tubular pores; clay films on vertical faces of peds; common fine salt masses and few fine nests of gypsum; slightly alkaline; gradual wavy boundary.
- Bkz**—16 to 32 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; hard, firm, sticky and plastic; few very fine roots between peds; few very fine tubular pores; 11 percent calcium carbonate equivalent; common fine soft masses of carbonate and few fine nests of gypsum and common fine salt masses; few fine prominent dark yellowish brown (10YR 4/4) redox concentrations; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C1**—32 to 63 inches; light yellowish brown (2.5Y 6/3) clay loam, olive brown (2.5Y 4/3) moist; massive; hard, firm, sticky and plastic; few very fine tubular pores; 1 percent shale chips; 8 percent calcium carbonate equivalent; few fine salt masses and few fine nests of gypsum; common fine prominent dark yellowish brown (10YR 4/4) redox concentrations and few fine prominent gray (10YR 5/1) depletions; 2 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C2**—63 to 80 inches; pale yellow (2.5Y 7/4) clay loam, light olive brown (2.5Y 5/4) moist; massive; hard, firm, sticky and plastic; few very fine tubular pores; 5 percent shale chips; 7 percent calcium carbonate equivalent; few fine nests of gypsum; common fine prominent dark yellowish brown (10YR 4/4) redox concentrations; 2 percent pebbles; slightly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 20 inches

Depth to carbonates: 5 to 16 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: 5 to 16 inches

Remarks: Some pedons have an A horizon.

E horizon:

Hue - 10YR; value - 5 to 7 (3 or 4 moist); and chroma - 1 or 2

Texture - loam but is clay loam or silt loam in some pedons

Btn horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 or 3 moist); and chroma - 1 to 4

Texture - clay loam or clay

Btnz or Btnkz horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 or 3 moist); and chroma - 2 to 4

Texture - clay loam or clay

Bkz horizon:

Hue - 10YR or 2.5Y; value - 5 to 8 (3 to 6 moist); and chroma - 2 to 4
Texture - clay loam or clay

C horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 5 to 8 (3 to 6 moist); and chroma - 2 to 4
Texture - clay loam or clay

Fordville Series

Depth to restrictive feature: Strongly contrasting textural stratification; top depth ranges from 20 to 40 inches

Drainage class: Well drained

Permeability: Moderate in the loamy sediments and very rapid in the underlying gravelly material

Landform: Outwash plains

Parent material: Loamy alluvium over glacial outwash

Slope: 0 to 6 percent

Typical Pedon

Fordville loam, in an area of Renshaw-Fordville loams, 0 to 2 percent slopes, 1,700 feet west and 1,850 feet north of the southeast corner of sec. 14, T. 118 N., R. 61 W.; USGS Conde SW, SD topographic quadrangle; lat. 45 degrees 1 minutes 42 seconds N. and long. 98 degrees 7 minutes 51 seconds W.

Ap—0 to 8 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak fine subangular blocky structure parting to weak fine granular; slightly hard, friable; many very fine roots throughout; common very fine tubular pores; 2 percent gravel; neutral; abrupt smooth boundary.

Bw1—8 to 15 inches; dark gray (10YR 4/1) loam, very dark gray (10YR 3/1) moist; weak medium and coarse prismatic structure parting to weak medium subangular blocky; slightly hard, friable; common very fine roots throughout; many very fine tubular pores; 2 percent gravel; slightly alkaline; clear smooth boundary.

Bw2—15 to 21 inches; dark gray (10YR 4/1) loam, very dark gray (10YR 3/1) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; slightly hard, friable; common very fine roots throughout; many very fine tubular pores; 2 percent gravel; slightly alkaline; clear smooth boundary.

Bk—21 to 33 inches; pale yellow (2.5Y 7/3) loam, light olive brown (2.5Y 5/3) moist; weak fine and medium subangular blocky structure; slightly hard, friable; few very fine roots throughout; common very fine tubular pores; 21 percent calcium carbonate equivalent; common fine and medium soft masses of carbonate; 5 percent gravel; strongly effervescent; moderately alkaline; abrupt wavy boundary.

2C1—33 to 64 inches; light brownish gray (2.5Y 6/2) gravelly sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose; 18 percent calcium carbonate equivalent; few carbonate coats on sand and gravel; strongly effervescent; 20 percent gravel; moderately alkaline; gradual wavy boundary.

2C2—64 to 80 inches; light gray (2.5Y 7/2) sand, grayish brown (2.5Y 5/2) moist; single grain; loose; 7 percent calcium carbonate equivalent; slightly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 to 30 inches

Depth to carbonates: 17 to 40 inches

Depth to contrasting parent material: 20 to 40 inches over gravelly material

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1 or 2 (1 moist)

Texture - loam

Bw horizon:

Hue - 10YR; value - 3 to 5 (2 to 4 moist); and chroma - 1 to 4

Texture - loam or clay loam

Bk horizon:

Hue - 10YR or 2.5Y; value - 4 to 8 (3 to 6 moist); and chroma - 2 or 3

Texture - loam or clay loam

2C horizon:

Hue - 10YR or 2.5Y; value - 4 to 7 (3 to 6 moist); and chroma - 2 to 4

Texture - sand, gravelly loamy sand, or gravelly sand but is loamy sand, gravelly coarse sand, very gravelly sand, or very gravelly loamy sand in some pedons

Forestburg Series

Depth to restrictive feature: None

Drainage class: Moderately well drained

Permeability: Rapid in the sandy sediments and moderately slow in the underlying glacial till

Landform: Till plains

Parent material: Sandy glaciofluvial sediments over loamy glacial till

Slope: 0 to 2 percent

Typical Pedon

Forestburg loamy sand, in an area of Forestburg-Elsmere loamy sands, 0 to 2 percent slopes, 350 feet west and 300 feet south of the northeast corner of sec. 28, T. 115 N., R. 64 W.; lat. 44 degrees 44 minutes 55 seconds N and long. 98 degrees 31 minutes 30 seconds W.

Ap—0 to 7 inches; dark gray (10YR 4/1) loamy sand, black (10YR 2/1) moist; weak fine granular structure; slightly hard, very friable; few very fine roots throughout; few very fine tubular pores; slightly acid; abrupt smooth boundary.

A—7 to 15 inches; dark grayish brown (10YR 4/2) loamy sand, very dark brown (10YR 2/2) moist; weak fine and medium subangular blocky structure; slightly hard, very friable; few very fine roots throughout; few very fine tubular pores; neutral; clear smooth boundary.

Bw1—15 to 19 inches; brown (10YR 5/3) loamy sand, dark brown (10YR 3/3) moist; weak medium subangular blocky structure parting to single grain; loose; few very fine roots throughout; neutral; clear smooth boundary.

Bw2—19 to 36 inches; pale brown (10YR 6/3) loamy sand, brown (10YR 4/3) moist; weak medium subangular blocky structure parting to single grain; loose; few fine faint dark yellowish brown (10YR 4/4) redox concentrations; neutral; clear wavy boundary.

2Bk—36 to 53 inches; light gray (2.5Y 7/2) loam, grayish brown (2.5Y 5/2) moist; weak medium and coarse prismatic structure parting to weak medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; 23 percent calcium carbonate equivalent; few fine soft masses of carbonate and few fine soft masses of iron-manganese; common fine

prominent dark yellowish brown (10YR 4/4) redox concentrations and common fine distinct gray (10YR 5/1) redox depletions; 2 percent pebbles; strongly effervescent; moderately alkaline; clear smooth boundary.

2C—53 to 80 inches; pale yellow (2.5Y 7/4) loam, light olive brown (2.5Y 5/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; 18 percent calcium carbonate equivalent; few fine soft masses of iron-manganese; common fine distinct dark yellowish brown (10YR 4/4) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; 3 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 10 to 20 inches

Depth to carbonates: 20 to 40 inches

Depth to contrasting parent material: 20 to 40 inches over glacial till

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 1 or 2

Texture - loamy sand but is fine sand, loamy fine sand, or sandy loam in some pedons

Bw horizon:

Hue - 10YR or 2.5Y; value - 4 to 6 (3 or 4 moist); and chroma - 1 to 3

Texture - loamy sand or loamy fine sand

2Bk or 2C horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - clay loam or loam

Forman Series

Depth to restrictive feature: None

Drainage class: Well drained

Permeability: Moderately slow

Landform: Till plains

Parent material: Loamy glacial till

Slope: 0 to 9 percent

Typical Pedon

Forman loam, in an area of Forman-Aastad loams, 0 to 3 percent slopes, 1,450 feet east and 1,175 feet north of the southwest corner of sec. 2, T. 120 N., R. 60 W.; USGS Conde, SD topographic quadrangle; lat. 45 degrees 13 minutes 54 seconds N. and long. 98 degrees 1 minutes 0 seconds W.

Ap—0 to 8 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak fine subangular blocky structure; slightly hard, friable; common very fine roots throughout; common very fine tubular pores; neutral; abrupt smooth boundary.

Bt—8 to 15 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate fine subangular blocky; slightly hard, firm, slightly sticky and slightly plastic; common very fine roots throughout; common very fine tubular pores; clay films on vertical faces of peds; neutral; clear smooth boundary.

Bk1—15 to 30 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak medium prismatic structure; hard, firm, slightly sticky and

- slightly plastic; few very fine roots throughout; few very fine tubular pores; 23 percent calcium carbonate equivalent; many fine and medium soft masses of carbonate; few fine distinct gray (10YR 5/1) relict redox features; 2 percent pebbles; strongly effervescent; moderately alkaline; gradual smooth boundary.
- Bk2—30 to 41 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few very fine roots throughout; few very fine tubular pores; 18 percent calcium carbonate equivalent; common fine and medium soft masses of carbonate; few fine prominent dark yellowish brown (10YR 4/6) and common fine distinct gray (10YR 5/1) relict redox features; 2 percent pebbles; strongly effervescent; moderately alkaline; gradual smooth boundary.
- C1—41 to 63 inches; light yellowish brown (2.5Y 6/3) clay loam, olive brown (2.5Y 4/3) moist; massive; hard, firm, sticky and plastic; few very fine tubular pores; 13 percent calcium carbonate equivalent; few fine soft masses of carbonate; few fine prominent dark yellowish brown (10YR 4/6) common and fine and medium distinct gray (10YR 5/1) relict redox features; 5 percent pebbles; strongly effervescent; moderately alkaline; clear wavy boundary.
- C2—63 to 80 inches; light yellowish brown (2.5Y 6/3) clay loam, light olive brown (2.5Y 5/3) moist; massive; hard, firm, sticky and plastic; few very fine tubular pores; 12 percent calcium carbonate equivalent; common fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine distinct gray (10YR 5/1) redox depletions; 5 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches

Depth to carbonates: 10 to 24 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 40 inches

A horizon:

Hue - 10YR; value - 3 or 4 (2 moist); and chroma - 1

Texture - loam but is clay loam in some pedons

Bt horizon:

Hue - 10YR or 2.5Y; value - 4 or 5 (3 or 4 moist); and chroma - 1 to 4

Texture - clay loam

Bk horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - clay loam or loam

C horizon:

Hue - 10YR or 2.5Y; value - 4 to 6 (3 to 5 moist); and chroma - 2 to 6

Texture - clay loam or loam

Gardena Series

Depth to restrictive feature: None

Drainage class: Moderately well drained

Permeability: Moderate

Landform: Lake plains

Parent material: Silty and loamy glaciolacustrine sediments

Slope: 0 to 3 percent

Typical Pedon

Gardena very fine sandy loam, in an area of Eckman-Gardena very fine sandy loams, 0 to 2 percent slopes, 2,600 feet east and 150 feet north of the southwest corner of sec. 12, T. 120 N., R. 62 W.; USGS Randolph, SD topographic quadrangle; lat. 45 degrees 12 minutes 51 seconds N. and long. 98 degrees 14 minutes 14 seconds W.

- Ap—0 to 9 inches; dark gray (10YR 4/1) very fine sandy loam, black (10YR 2/1) moist; weak fine and medium subangular blocky structure parting to weak fine granular; soft, very friable; few very fine roots throughout; few very fine tubular pores; neutral; abrupt smooth boundary.
- A—9 to 20 inches; dark grayish brown (10YR 4/2) very fine sandy loam, very dark brown (10YR 2/2) moist; weak fine subangular blocky structure parting to weak fine and medium granular; soft, very friable; few very fine roots throughout; few very fine tubular pores; neutral; clear wavy boundary.
- Bw1—20 to 28 inches; dark grayish brown (10YR 4/2) very fine sandy loam, very dark brown (10YR 2/2) moist; weak fine and medium subangular blocky structure; soft, very friable; few very fine roots throughout; few very fine tubular pores; slightly alkaline; clear wavy boundary.
- Bw2—28 to 36 inches; brown (10YR 5/3) very fine sandy loam, brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; soft, very friable; few very fine tubular pores; slightly alkaline; clear wavy boundary.
- Bk—36 to 51 inches; pale yellow (2.5Y 7/3) very fine sandy loam, light olive brown (2.5Y 5/3) moist; weak fine and medium subangular blocky structure; soft, very friable; few very fine tubular pores; 10 percent calcium carbonate equivalent; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C—51 to 80 inches; pale yellow (2.5Y 7/3) loamy very fine sand, light olive brown (2.5Y 5/3) moist; single grain; loose; 7 percent calcium carbonate equivalent; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 to 40 inches

Depth to carbonates: 14 to 40 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1 or 2 in the lower part

Texture - very fine sandy loam or silt loam but is loam in some pedons

Bw horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 to 4 moist); and chroma - 1 to 3

Texture - silt loam or very fine sandy loam but is loam in some pedons

Bk horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - silt loam or very fine sandy loam but is loam in some pedons

C horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - loamy very fine sand, very fine sandy loam, or silt loam but is loam in some pedons

Glyndon Series

Depth to restrictive feature: None

Drainage class: Moderately well drained

Permeability: Moderate

Landform: Lake plains

Parent material: Silty and loamy glaciolacustrine sediments

Slope: 0 to 2 percent

Typical Pedon

Glyndon silt loam, in an area of Gardena-Glyndon silt loams, 0 to 2 percent slopes, 200 feet west and 1,100 feet south of the northeast corner of sec. 24, T. 120 N., R. 62 W.; USGS Randolph, SD topographic quadrangle; lat. 45 degrees 11 minutes 48 seconds N. and long. 98 degrees 13 minutes 40 seconds W.

- Ap—0 to 7 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; weak fine subangular blocky structure parting to weak fine and medium granular; slightly hard, very friable; few very fine roots throughout; few very fine tubular pores; 6 percent calcium carbonate equivalent; strongly effervescent; slightly alkaline; abrupt smooth boundary.
- A—7 to 12 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; weak fine subangular blocky structure; slightly hard, very friable; few very fine roots throughout; few very fine tubular pores; 6 percent calcium carbonate equivalent; strongly effervescent; slightly alkaline; clear smooth boundary.
- Bk1—12 to 21 inches; light gray (2.5Y 7/2) silt loam, grayish brown (2.5Y 5/2) moist; weak fine and medium subangular blocky structure; slightly hard, very friable; few very fine roots throughout; common very fine tubular pores; 22 percent calcium carbonate equivalent; violently effervescent; strongly alkaline; clear wavy boundary.
- Bk2—21 to 29 inches; light gray (2.5Y 7/2) silt loam, light olive brown (2.5Y 5/3) moist; weak fine and medium subangular blocky structure; slightly hard, very friable; common very fine tubular pores; 22 percent calcium carbonate equivalent; violently effervescent; strongly alkaline; clear wavy boundary.
- Bk3—29 to 46 inches; pale yellow (2.5Y 7/3) silt loam, light olive brown (2.5Y 5/3) moist; weak fine and medium subangular blocky structure; slightly hard, very friable; few very fine tubular pores; 14 percent calcium carbonate equivalent; few fine distinct dark yellowish brown (10YR 4/4) redox concentrations; strongly effervescent; strongly alkaline; gradual wavy boundary.
- Bck—46 to 57 inches; light gray (2.5Y 7/2) silt loam, light olive brown (2.5Y 5/3) moist; weak medium subangular blocky structure; slightly hard, friable; few very fine tubular pores; 12 percent calcium carbonate equivalent; common fine prominent dark yellowish brown (10YR 4/4) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; strongly alkaline; gradual wavy boundary.
- Cg—57 to 80 inches; pale yellow (2.5Y 8/3) silt loam, light yellowish brown (2.5Y 6/3) moist; massive; slightly hard, friable; few very fine tubular pores; 14 percent calcium carbonate equivalent; few fine soft masses of iron-manganese; many fine and medium prominent dark yellowish brown (10YR 4/4) redox concentrations and common fine and medium prominent gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches

Depth to carbonates: 0 to 8 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 40 inches

Remarks: Some pedons lack a B_{ck} horizon.

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1 or 2

Texture - silt loam but is very fine sandy loam or loam in some pedons

B_k horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 4 to 8 (3 to 7 moist); and chroma - 1 to 4

Texture - very fine sandy loam or silt loam but is loam in some pedons

C horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 5 to 8 (4 to 7 moist); and chroma - 2 to 4

Texture - silt loam, very fine sandy loam, loamy very fine sand, or very fine sand but is loam in some pedons

Grat Series

Depth to restrictive feature: Strongly contrasting textural stratification; top depth ranges from 20 to 40 inches

Drainage class: Poorly drained

Permeability: Slow in the solum and rapid in the underlying gravelly material

Landform: Outwash plains

Parent material: Clayey alluvium over glacial outwash

Slope: 0 to 1 percent

Typical Pedon

Grat loam, in an area of Dimo-Grat loams, 0 to 2 percent slopes, 1,600 feet north and 1,500 feet east of the southwest corner of sec. 25, T. 114 N., R. 61 W.; USGS Bloomfield, SD topographic quadrangle; lat. 44 degrees 38 minutes 16 seconds N. and long. 98 degrees 6 minutes 50 seconds W.

Ap—0 to 6 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; few very fine tubular pores; neutral; abrupt smooth boundary.

A—6 to 9 inches; gray (10YR 5/1) clay loam, very dark gray (10YR 3/1) moist; weak fine subangular blocky structure parting to weak fine and medium granular; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; few very fine tubular pores; neutral; clear smooth boundary.

B_t—9 to 27 inches; dark gray (10YR 4/1) clay loam, very dark gray (10YR 3/1) moist; moderate medium prismatic structure parting to weak fine subangular blocky; hard, firm, sticky and plastic; few very fine roots throughout; few very fine tubular pores; clay films on vertical faces of peds; 4 percent calcium carbonate equivalent; few fine faint brown (10YR 4/3) redox concentrations; slightly effervescent; neutral; abrupt wavy boundary.

2C₁—27 to 43 inches; light brownish gray (2.5Y 6/2) gravelly loamy sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose; 15 percent calcium carbonate equivalent; carbonate coats on sand and gravel; few fine prominent dark yellowish brown (10YR 4/6) redox concentrations and few fine distinct gray (10YR 5/1) redox depletions; 25 percent gravel; strongly effervescent; slightly alkaline; gradual wavy boundary.

2C2—43 to 57 inches; light yellowish brown (2.5Y 6/3) gravelly loamy sand, olive brown (2.5Y 4/3) moist; single grain; loose; 10 percent calcium carbonate equivalent; carbonate coats on sand and gravel; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations and few fine prominent gray (10YR 5/1) redox depletions; 25 percent gravel; strongly effervescent; slightly alkaline; clear smooth boundary.

3Cg3—57 to 80 inches; light olive gray (5Y 6/2) clay loam, olive gray (5Y 4/2) moist; massive; hard, firm, sticky and plastic; few very fine tubular pores; 11 percent calcium carbonate equivalent; few fine soft masses of carbonate; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; 3 percent pebbles; strongly effervescent; slightly alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 40 inches

Depth to carbonates: 3 to 40 inches

Depth to contrasting parent material: 20 to 40 inches over gravelly material

Depth to gypsum and other visible salts other than carbonates: Greater than 20 inches

Remarks: Some pedons have a Btk or Bkg horizon.

A horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 1 or 2

Texture - loam but is clay loam or silt loam in some pedons

Bt horizon:

Hue - 10YR or 2.5Y; value - 4 to 6 (3 to 5 moist); and chroma - 1 or 2

Texture - clay loam, clay, or silty clay loam

Bk horizon:

Hue - 2.5Y or 5Y; value - 5 to 8 (4 to 6 moist); and chroma - 1 to 4

Texture - clay loam, silty clay loam, clay, or silty clay

2C horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - gravelly loamy sand or very gravelly loamy sand

3C horizon:

Hue - 5Y; value - 6 to 8 (4 to 6 moist); and chroma - 2 or 3

Texture - clay loam, loam, or silty clay loam

Great Bend Series

Depth to restrictive feature: None

Drainage class: Well drained

Permeability: Moderate in the solum and moderate to slow in the underlying material

Landform: Lake plains

Parent material: Silty glaciolacustrine sediments over loamy glacial till

Slope: 0 to 9 percent

Typical Pedon

Great Bend silt loam (fig. 21), in an area of Great Bend-Zell silt loams, 2 to 6 percent slopes, 375 feet east and 1,750 feet north of the southwest corner of sec. 5, T. 117 N., R. 62 W., USGS Frankfort SD topographic quadrangle; lat. 44 degrees 58 minutes 20 seconds N. and long. 98 degrees 19 minutes 39 seconds W.

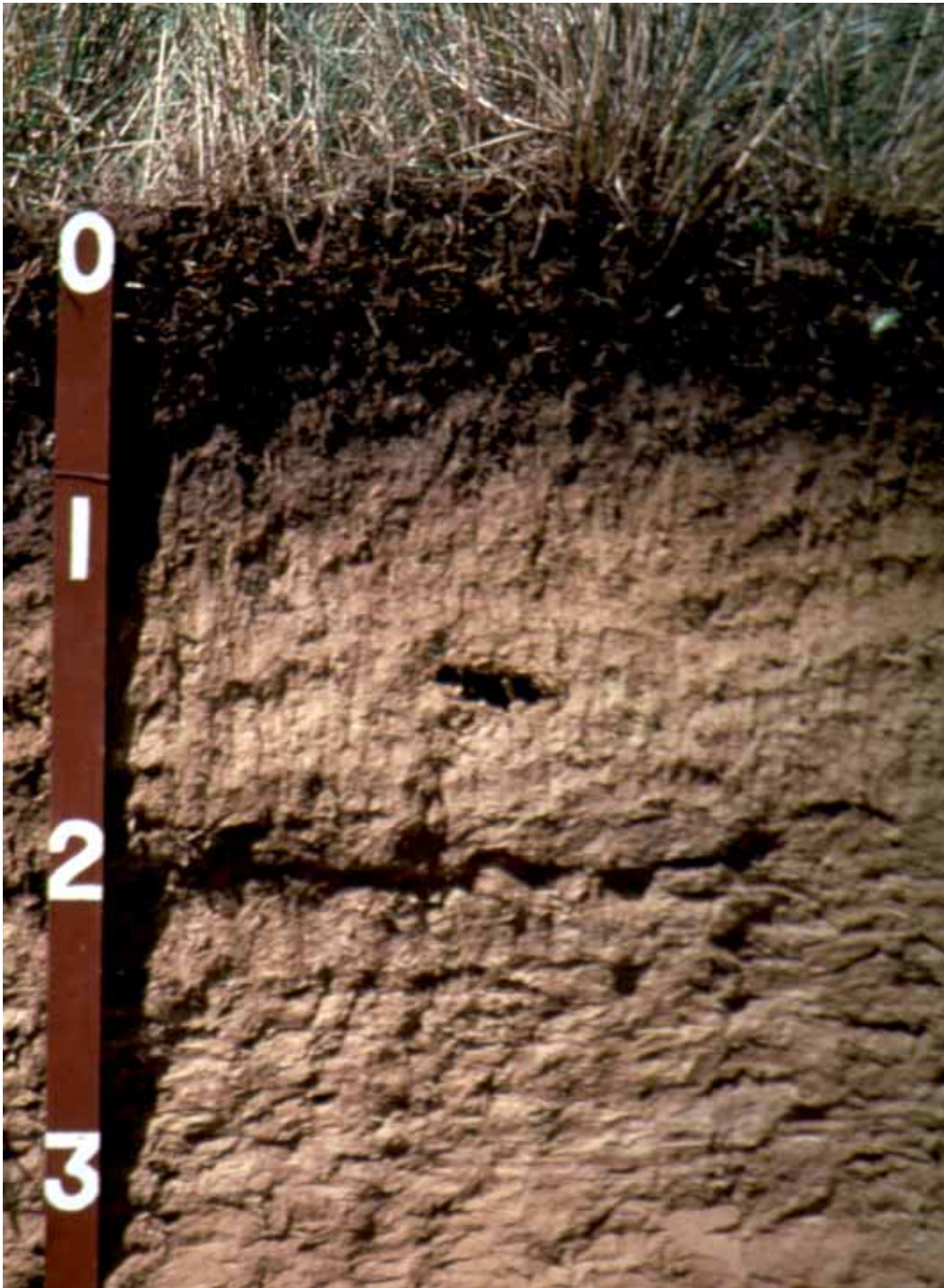


Figure 21. Profile of Great Bend silt loam. This soil is dark to a depth of about 11 inches; calcium carbonate is below this depth. Depth is marked in feet.

Ap—0 to 7 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; weak fine granular structure; slightly hard, friable; common very fine roots throughout; few very fine tubular pores; slightly alkaline; abrupt smooth boundary.

Bw—7 to 12 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak medium and coarse prismatic structure parting to weak medium subangular blocky; slightly hard, friable; common very fine roots

throughout; common very fine tubular pores; moderately alkaline; clear smooth boundary.

Bk1—12 to 20 inches; pale yellow (2.5Y 7/4) silt loam, light olive brown (2.5Y 5/4) moist; weak medium and coarse prismatic structure parting to weak medium subangular blocky; slightly hard, friable; few very fine roots throughout; common very fine tubular pores; 18 percent calcium carbonate equivalent; strongly effervescent; moderately alkaline; clear wavy boundary.

Bk2—20 to 32 inches; pale yellow (2.5Y 7/4) silt loam, light olive brown (2.5Y 5/4) moist; weak fine and medium subangular blocky structure; slightly hard, friable; few very fine roots throughout; common very fine tubular pores; 21 percent calcium carbonate equivalent; strongly effervescent; moderately alkaline; gradual wavy boundary.

C1—32 to 53 inches; pale yellow (2.5Y 7/4) silt loam, light olive brown (2.5Y 5/4) moist; massive; slightly hard, friable; few very fine tubular pores; varved with very fine sand to clay; 18 percent calcium carbonate equivalent; strongly effervescent; strongly alkaline; gradual wavy boundary.

C2—53 to 80 inches; pale yellow (2.5Y 7/3) silt loam, light olive brown (2.5Y 5/3) moist; few very fine tubular pores; varved with very fine sand to clay; 15 percent calcium carbonate equivalent; few fine soft masses of iron-manganese; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations and few fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 6 to 16 inches

Depth to carbonates: 10 to 32 inches

Depth to contrasting parent material: Greater than 40 inches over glacial till

Depth to gypsum and other visible salts other than carbonates: Greater than 30 inches

Remarks: Some pedons have a loam or clay loam 2C horizon.

A horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 1 or 2

Texture - silt loam but is silty clay loam in some pedons

Bw horizon:

Hue - 10YR or 2.5Y; value - 4 to 6 (3 to 5 moist); and chroma - 2 to 4

Texture - silt loam or silty clay loam

Bk horizon:

Hue - 10YR or 2.5Y; value - 6 to 8 (4 to 6 moist); and chroma - 2 to 4

Texture - silt loam or silty clay loam

C horizon:

Hue - 2.5Y; value - 5 to 8 (4 to 6 moist); and chroma - 2 to 4

Texture - silt loam or silty clay loam and typically is varved with very fine sand to clay in the lower part

2C horizon:

Hue - 2.5Y; value - 5 to 8 (4 to 6 moist); and chroma - 2 to 4

Texture - clay loam or loam

Hamerly Series

Depth to restrictive feature: None

Drainage class: Somewhat poorly drained

Permeability: Moderately slow

Landform: Till plains

Parent material: Loamy glacial till

Slope: 0 to 2 percent

Typical Pedon

Hamerly loam, 0 to 2 percent slopes, 225 feet south and 1,850 feet east of the northwest corner of sec. 15, T. 119 N., R. 60 W.; USGS Turton, SD topographic quadrangle; lat. 45 degrees 7 minutes 25 seconds N. and long. 98 degrees 2 minutes 9 seconds W.

- A—0 to 9 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak medium subangular blocky structure parting to moderate fine granular; slightly hard, very friable; many very fine and fine roots throughout; many very fine tubular pores; 8 percent calcium carbonate equivalent; slightly effervescent; slightly alkaline; abrupt smooth boundary.
- Bk1—9 to 14 inches; light gray (2.5Y 7/2) loam, grayish brown (2.5Y 5/2) moist; weak medium subangular blocky structure; slightly hard, friable; common very fine roots throughout; many very fine tubular pores; 29 percent calcium carbonate equivalent; violently effervescent; moderately alkaline; clear wavy boundary.
- Bk2—14 to 29 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; weak medium subangular blocky structure; hard, friable; few very fine roots throughout; common very fine tubular pores; 23 percent calcium carbonate equivalent; few fine prominent dark yellowish brown (10YR 4/6) redox concentrations; violently effervescent; moderately alkaline; gradual wavy boundary.
- C1—29 to 68 inches; light olive gray (5Y 6/2) clay loam, olive gray (5Y 4/2) moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine tubular pores; 16 percent calcium carbonate equivalent; common fine soft masses of iron-manganese; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations and few fine prominent gray (10YR 5/1) redox depletions; 2 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C2—68 to 80 inches; light gray (5Y 7/2) clay loam, olive gray (5Y 5/2) moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine tubular pores; 17 percent calcium carbonate equivalent; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; 3 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 18 inches

Depth to carbonates: 0 to 6 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 40 inches

A horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 or 3 moist); and chroma - 1 or 2

Texture - loam but is clay loam in some pedons

Bk horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 4 to 8 (3 to 7 moist); and chroma - 1 to 4

Texture - loam or clay loam

C horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 5 to 8 (4 to 6 moist); and chroma - 1 to 4
Texture - loam or clay loam

Hand Series

Depth to restrictive feature: None

Drainage class: Well drained

Permeability: Moderate

Landform: Till plains and moraines

Parent material: Loamy glacial till

Slope: 0 to 15 percent

Typical Pedon

Hand loam (fig. 22), in an area of Hand-Ethan-Bonilla loams, 1 to 6 percent slopes, 2,250 feet west and 1,950 feet south of the northeast corner of sec. 24, T. 115 N., R. 64 W.; USGS Frankfort SW, SD topographic quadrangle; lat. 44 degrees 45 minutes 28 seconds N. and long. 98 degrees 28 minutes 38 seconds W.

- A—0 to 7 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak fine granular structure; slightly hard, friable; many very fine and fine roots throughout; few very fine tubular pores; neutral; clear smooth boundary.
- Bw—7 to 18 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable; common very fine roots throughout; common very fine tubular pores; slightly alkaline; clear smooth boundary.
- Bk1—18 to 26 inches; pale yellow (2.5Y 7/3) loam, light olive brown (2.5Y 5/3) moist; weak fine and medium subangular blocky structure; hard, friable; common very fine roots throughout; common very fine tubular pores; 18 percent calcium carbonate equivalent; common fine soft masses of carbonate; strongly effervescent; moderately alkaline; gradual wavy boundary.
- Bk2—26 to 35 inches; pale yellow (2.5Y 7/3) loam, light olive brown (2.5Y 5/3) moist; weak fine and medium subangular blocky structure; hard, friable; few very fine roots throughout; common very fine tubular pores; 19 percent calcium carbonate equivalent; many fine and medium soft masses of carbonate; 1 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C1—35 to 52 inches; light yellowish brown (2.5Y 6/4) loam, olive brown (2.5Y 4/4) moist; massive; slightly hard, very friable; few very fine roots throughout; few very fine tubular pores; 14 percent calcium carbonate equivalent; common fine distinct yellowish brown (10YR 5/6) relict redox features; 2 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C2—52 to 76 inches; pale yellow (2.5Y 7/4) loam, light olive brown (2.5Y 5/4) moist; massive; slightly hard, very friable; few very fine tubular pores; 15 percent calcium carbonate equivalent; common fine and medium distinct yellowish brown (10YR 5/6) redox concentrations and few fine prominent gray (10YR 6/1) redox depletions; 2 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C3—76 to 80 inches; light yellowish brown (2.5Y 6/4) loam, olive brown (2.5Y 4/4) moist; massive; slightly hard, friable; few very fine tubular pores; 11 percent calcium carbonate equivalent; few fine soft masses of iron-manganese; common fine and medium distinct yellowish brown (10YR 5/6) redox concentrations and common fine and medium prominent gray (10YR 6/1) redox depletions; 2 percent pebbles; strongly effervescent; moderately alkaline.

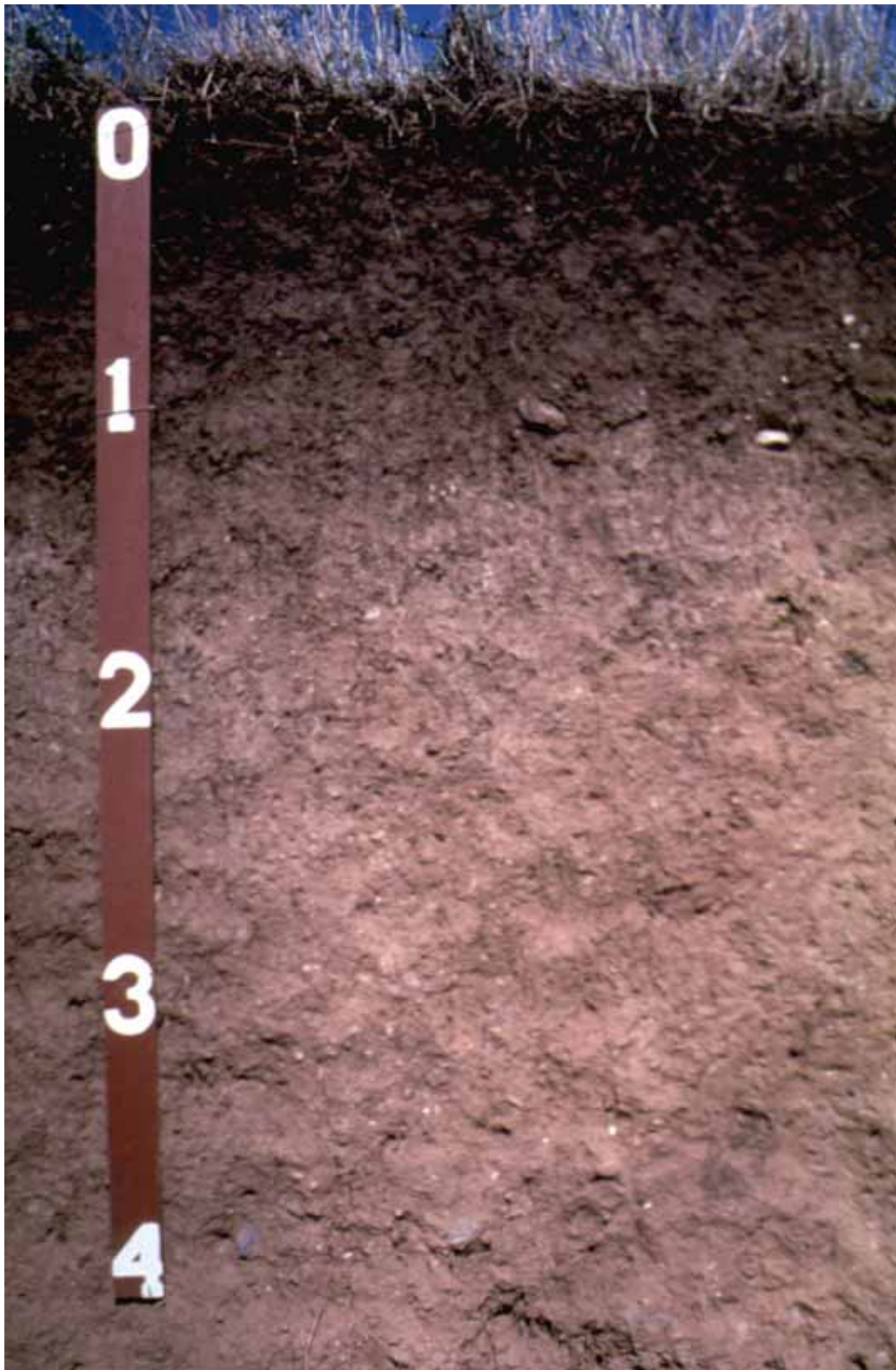


Figure 22. Profile of Hand loam. The soil is dark to a depth of about 13 inches; calcium carbonate is below this depth. Depth is marked in feet.

Range in Characteristics

Mollic epipedon thickness: 8 to 20 inches

Depth to carbonates: 12 to 26 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 50 inches

A horizon:

Hue - 10YR; value - 4 or 5 (2 or 3 moist); and chroma - 1 or 2

Texture - loam or fine sandy loam

Bw horizon:

Hue - 10YR or 2.5Y; value - 4 or 5 (3 or 4 moist); and chroma - 2 or 3

Texture - loam

Bk horizon:

Hue - 10YR or 2.5Y; value - 6 or 7 (4 to 6 moist); and chroma - 1 to 4

Texture - loam but is clay loam in some pedons

C horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 6 to 7 (4 to 6 moist); and chroma - 1 to 4

Texture - loam but is clay loam or sandy loam in some pedons

Harmony Series

Depth to restrictive feature: None

Drainage class: Moderately well drained

Permeability: Moderately slow in the solum and moderate to slow in the underlying material

Landform: Lake plains

Parent material: Clayey glaciolacustrine sediments over loamy glacial till

Slope: 0 to 2 percent

Typical Pedon

Harmony silt loam (fig. 23), in an area of Harmony-Beotia silt loams, 0 to 2 percent slopes, 2,425 feet west and 1,250 feet north of the southeast corner of sec. 19, T. 117 N., R. 62 W.; USGS Frankfort, SD topographic quadrangle; lat. 44 degrees 55 minutes 37 seconds N. and long. 98 degrees 20 minutes 18 seconds W.

Ap—0 to 7 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; moderate medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; few very fine tubular pores; slightly acid; abrupt smooth boundary.

A—7 to 11 inches; dark gray (10YR 4/1) silty clay loam, black (10YR 2/1) moist; weak medium subangular blocky structure parting to moderate fine and medium granular; hard, firm, slightly sticky and slightly plastic; few very fine roots throughout; few very fine tubular pores; slightly acid; clear smooth boundary.

Bt1—11 to 16 inches; gray (10YR 5/1) silty clay loam, very dark gray (10YR 3/1) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; hard, firm, sticky and plastic; few very fine roots throughout; few very fine tubular pores; clay films on vertical faces of peds; neutral; clear smooth boundary.

Bt2—16 to 25 inches; grayish brown (10YR 5/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to moderate fine and medium subangular blocky; hard, firm, sticky and plastic; few very fine

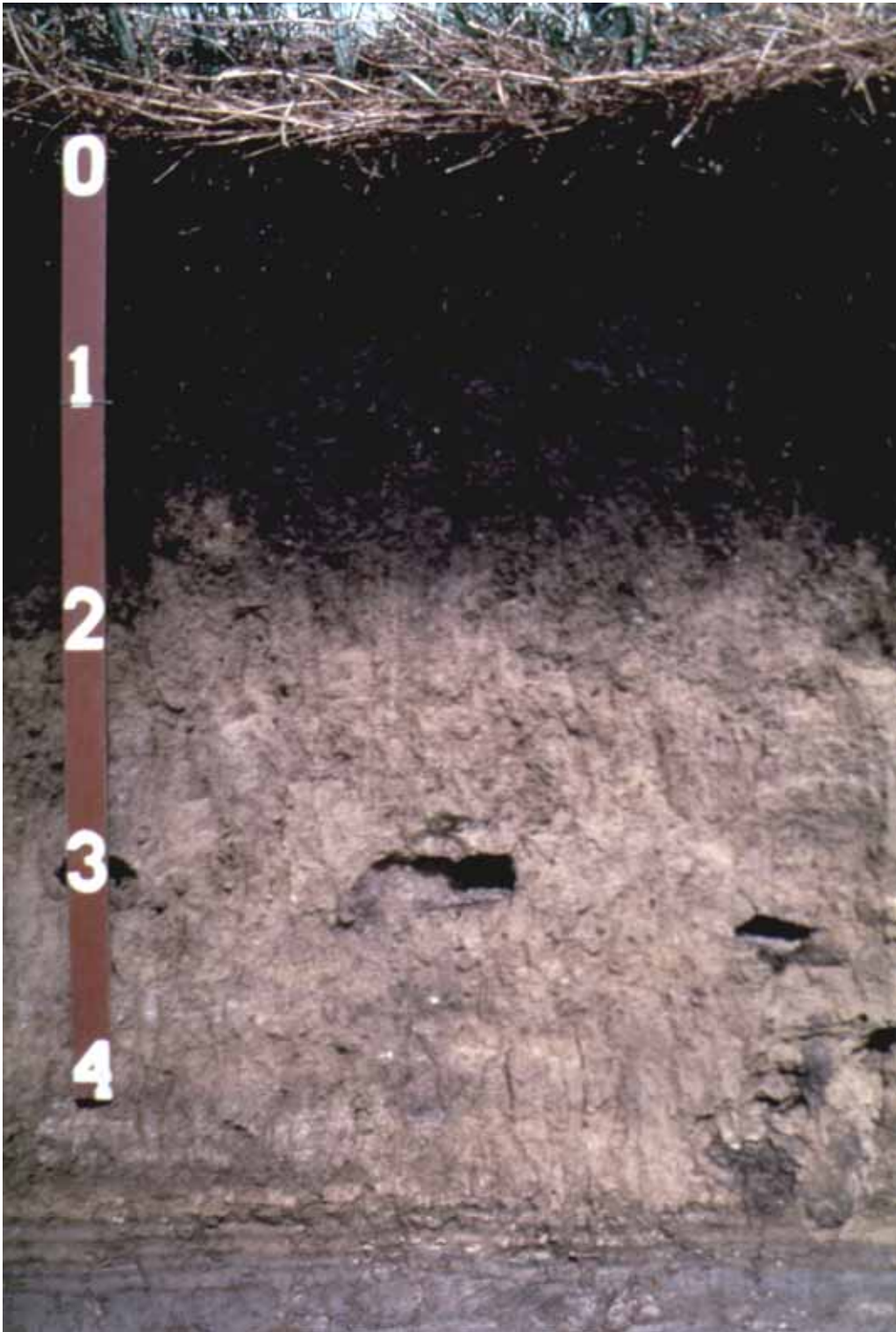


Figure 23. Profile of Harmony silt loam. This soil is dark to a depth of about 23 inches. Depth is marked in feet.

roots throughout; few very fine tubular pores; clay films on vertical faces of peds; neutral; clear smooth boundary.

- Bk—25 to 34 inches; light gray (2.5Y 7/2) silty clay loam, light olive brown (2.5Y 5/3) moist; weak medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; common very fine tubular pores; 21 percent calcium carbonate equivalent; strongly effervescent; moderately alkaline; clear wavy boundary.
- C1—34 to 56 inches; pale yellow (2.5Y 8/2) silty clay loam, light yellowish brown (2.5Y 6/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; varved with very fine sand to clay; 16 percent calcium carbonate equivalent; few fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline; clear wavy boundary.
- C2—56 to 80 inches; light yellowish brown (2.5Y 6/4) silt loam, light olive brown (2.5Y 5/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; varved with very fine sand to clay; 15 percent calcium carbonate equivalent; few fine prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 to 30 inches

Depth to carbonates: 16 to 38 inches

Depth to contrasting parent material: Greater than 40 inches over glacial till

Depth to gypsum and other visible salts other than carbonates: Greater than 40 inches

Remarks: Some pedons have a loam or clay loam 2C horizon.

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1

Texture - silt loam or silty clay loam

Bt horizon:

Hue - 10YR or 2.5Y; value - 4 to 6 (3 or 4 moist); and chroma - 1 to 3

Texture - silty clay loam or silty clay

Bk horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 5 to 8 (4 to 6 moist); and chroma - 2 to 4

Texture - silty clay loam or silt loam

C horizon:

Hue - 2.5Y or 5Y; value - 6 to 8 (4 to 6 moist); and chroma - 2 to 4

Texture - silt loam or silty clay loam and typically is varved with very fine sand to clay in the lower part

2C horizon:

Hue - 2.5Y or 5Y; value - 6 to 8 (4 to 6 moist); and chroma - 2 to 4

Texture - clay loam or loam

Harriet Series

Depth to restrictive feature: Natric; top depth ranges from 0 to 5 inches

Drainage class: Poorly drained

Permeability: Very slow

Landform: Flood plains

Parent material: Clayey alluvium

Slope: 0 to 1 percent

Typical Pedon

Harriet loam, 0 to 1 percent slopes, 120 feet west and 1,600 feet south of the northeast corner of sec. 15, T. 118 N., R. 61 W.; USGS Conde SW, SD topographic

quadrangle; lat. 45 degrees 2 minutes 2 seconds N. and long. 98 degrees 8 minutes 47 seconds W.

- E—0 to 2 inches; gray (10YR 6/1) loam, very dark gray (10YR 3/1) moist; weak thin platy structure; soft, very friable; many very fine and fine roots throughout; few very fine tubular pores; slightly alkaline; abrupt wavy boundary.
- Btn—2 to 8 inches; dark gray (10YR 4/1) silty clay loam, black (10YR 2/1) moist; moderate medium columnar structure; extremely hard, firm, slightly sticky and slightly plastic; common very fine and fine roots between peds; few very fine tubular pores; gray (10YR 6/1) coats on tops of columns and clay films on vertical faces of peds; moderately alkaline; clear wavy boundary.
- Btnz—8 to 17 inches; gray (10YR 5/1) silty clay loam, very dark gray (10YR 3/1) moist; moderate coarse prismatic structure parting to weak medium subangular blocky; extremely hard, firm, slightly sticky and slightly plastic; few very fine roots between peds; few very fine tubular pores; 3 percent calcium carbonate equivalent; clay films on vertical faces of peds; common fine salt masses and few fine nests of gypsum; slightly effervescent; moderately alkaline; clear wavy boundary.
- Bkzg1—17 to 25 inches; olive gray (5Y 5/2) silty clay loam, dark olive gray (5Y 3/2) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; very hard, firm, slightly sticky and slightly plastic; few very fine roots between peds; few very fine tubular pores; 17 percent calcium carbonate equivalent; common fine soft masses of carbonate and common fine salt masses and few fine nests of gypsum; strongly effervescent; strongly alkaline; gradual wavy boundary.
- Bkzg2—25 to 34 inches; light olive gray (5Y 6/2) silty clay loam, olive gray (5Y 4/2) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; very hard, firm, slightly sticky and slightly plastic; few very fine tubular pores; 21 percent calcium carbonate equivalent; common fine soft masses of carbonate and common fine salt masses and few fine nests of gypsum; strongly effervescent; strongly alkaline; gradual wavy boundary.
- Bkzg3—34 to 42 inches; light gray (5Y 7/2) silty clay loam, olive gray (5Y 5/2) moist; weak fine and medium subangular blocky structure; very hard, firm, slightly sticky and slightly plastic; common very fine tubular pores; 29 percent calcium carbonate equivalent; common fine soft masses of carbonate and common fine salt masses and few fine nests of gypsum; common fine prominent dark yellowish brown (10YR 4/4) redox concentrations; strongly effervescent; strongly alkaline; gradual wavy boundary.
- 2C1—42 to 51 inches; light yellowish brown (2.5Y 6/3) sandy loam, olive brown (2.5Y 4/3) moist; massive; slightly hard, very friable; few very fine tubular pores; 9 percent calcium carbonate equivalent; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations; slightly effervescent; strongly alkaline; gradual wavy boundary.
- 3C2—51 to 80 inches; pale yellow (2.5Y 7/3) clay loam, light olive brown (2.5Y 5/3) moist; massive; very hard, firm, slightly sticky and slightly plastic; few very fine tubular pores; 12 percent calcium carbonate equivalent; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; strongly alkaline.

Range in Characteristics

Mollic epipedon thickness: 14 to 26 inches

Depth to carbonates: 0 to 11 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: 0 to 11 inches

E horizon:

Hue - 10YR, 2.5Y, or neutral; value - 4 to 7 (2 to 5 moist); and chroma - 0 or 1

Texture - loam but is silt loam in some pedons

Btn or Btnz horizon:

Hue - 10YR, 2.5Y, 5Y, or neutral; value - 3 to 5 (2 to 4 moist); and chroma - 0 to 2

Texture - clay loam or silty clay loam but is silty clay or clay in some pedons

Bkz horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 4 to 7 (3 to 5 moist); and chroma - 1 to 3

Texture - silty clay loam, silty clay, clay, or clay loam

C horizon:

Hue - 10YR, 2.5Y, 5Y, or 5GY; value - 4 to 7 (3 to 5 moist); and chroma - 1 to 3

Texture - stratified sandy loam, clay loam, or loam but is clay or silty clay in some pedons

Heil Series

Depth to restrictive feature: Natric; top depth ranges from 1 to 4 inches

Drainage class: Poorly drained

Permeability: Very slow

Landform: Till plains

Parent material: Local clayey alluvium

Slope: 0 to 1 percent

Typical Pedon

Heil silt loam, 0 to 1 percent slopes, 1,350 feet east and 150 feet south of the northwest corner of sec. 8, T. 115 N., R. 60 W.; USGS Doland SE, SD topographic quadrangle; lat. 44 degrees 47 minutes 27 seconds N. and long. 98 degrees 4 minutes 32 seconds W.

E—0 to 2 inches; gray (10YR 5/1) silt loam, very dark gray (10YR 3/1) moist; weak thin platy structure; slightly hard, friable; many very fine and fine roots throughout; common very fine tubular pores; few fine iron-manganese concretions; few fine prominent dark yellowish brown (10YR 4/4) redox concentrations; neutral; abrupt smooth boundary.

Btn1—2 to 6 inches; dark gray (10YR 4/1) silty clay, black (10YR 2/1) moist; strong medium columnar structure; extremely hard, very firm, very sticky and very plastic; common very fine and fine roots between peds; few very fine tubular pores; cracks filled with surface material throughout; gray (10YR 5/1) coats on tops of columns and clay films on vertical faces of peds; few fine iron-manganese concretions; few fine prominent dark yellowish brown (10YR 4/4) redox concentrations; neutral; gradual smooth boundary.

Btn2—6 to 16 inches; dark gray (10YR 4/1) silty clay, black (10YR 2/1) moist; moderate fine and medium prismatic structure; extremely hard, very firm, very sticky and very plastic; few very fine roots between peds; few very fine tubular pores; wedge shaped natural aggregates; clay films on vertical faces of peds; slightly alkaline; gradual wavy boundary.

Btnz—16 to 24 inches; dark gray (10YR 4/1) silty clay, black (10YR 2/1) moist; moderate fine and medium prismatic structure parting to moderate fine angular

blocky; extremely hard, very firm, very sticky and very plastic; few very fine roots between peds; few very fine tubular pores; wedge shaped natural aggregates; clay films on vertical faces of peds; common fine salt masses and few fine gypsum crystals; moderately alkaline; gradual wavy boundary.

Bz—24 to 39 inches; gray (2.5Y 5/1) silty clay loam, very dark gray (2.5Y 3/1) moist; weak fine and medium subangular blocky structure; very hard, firm, sticky and plastic; few very fine roots throughout; few very fine tubular pores; 6 percent calcium carbonate equivalent; few fine soft masses of carbonate and common fine salt masses and few fine gypsum crystals; slightly effervescent; moderately alkaline; gradual wavy boundary.

Bkzg—39 to 47 inches; light brownish gray (2.5Y 6/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; weak fine and medium subangular blocky structure; very hard, firm, sticky and plastic; few very fine tubular pores; 18 percent calcium carbonate equivalent; common fine soft masses of carbonate and common fine salt masses and common fine soft masses of iron-manganese and few fine gypsum crystals; few fine distinct dark yellowish brown (10YR 4/4) redox concentrations and few fine distinct gray (10YR 6/1) redox depletions; strongly effervescent; moderately alkaline; gradual wavy boundary.

Cg1—47 to 59 inches; pale olive (5Y 6/3) clay loam, olive (5Y 4/3) moist; massive; very hard, firm, sticky and plastic; few very fine tubular pores; 8 percent calcium carbonate equivalent; few iron stains; few fine soft masses of carbonate and common fine soft masses of iron-manganese; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; strongly alkaline; gradual wavy boundary.

Cg2—59 to 80 inches; pale olive (5Y 6/3) clay loam, olive (5Y 4/3) moist; massive; very hard, firm, sticky and plastic; few very fine tubular pores; 9 percent calcium carbonate equivalent; few iron stains; few fine soft masses of carbonate and common fine soft masses of iron-manganese; many fine prominent dark yellowish brown (10YR 4/6) redox concentrations and many fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; strongly alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 45 inches

Depth to carbonates: 12 to 40 inches

Depth to contrasting parent material: Greater than 40 inches over glacial till

Depth to gypsum and other visible salts other than carbonates: Greater than 20 inches

E horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 4 to 8 (2 to 5 moist); and chroma - 1 or 2

Texture - silt loam but is silty clay loam or silty clay in some pedons

Btn or Btnz horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 4 to 6 (2 to 4 moist); and chroma - 1 or 2

Texture - silty clay or clay

Bz or Bkzg horizon:

Hue - 2.5Y or 5Y; value - 4 to 7 (3 to 5 moist); and chroma - 1 to 3

Texture - silty clay, clay, or silty clay loam but is clay loam in some pedons

Cg horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (3 to 5 moist); and chroma - 1 to 4

Texture - silty clay, clay, clay loam, or silty clay loam

Henkin Series

Depth to restrictive feature: None

Drainage class: Well drained

Permeability: Moderately rapid

Landform: Outwash plains

Parent material: Loamy glaciofluvial sediments

Slope: 0 to 6 percent

Typical Pedon

Henkin fine sandy loam, in an area of Henkin-Blendon fine sandy loams, 2 to 6 percent slopes, 180 feet north and 1,700 feet east of the southwest corner of sec. 9, T. 116 N., R. 64 W.; USGS Redfield S., SD topographic quadrangle; lat. 44 degrees 51 minutes 55 seconds N. and long. 98 degrees 32 minutes 13 seconds W.

Ap—0 to 7 inches; dark gray (10YR 4/1) fine sandy loam, very dark gray (10YR 3/1) moist; weak fine subangular blocky structure parting to moderate fine granular; slightly hard, very friable; common very fine and fine roots throughout; few very fine tubular pores; neutral; abrupt smooth boundary.

Bw1—7 to 15 inches; dark grayish brown (10YR 4/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, very friable; common very fine roots throughout; few very fine tubular pores; neutral; clear smooth boundary.

Bw2—15 to 35 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, very friable; few very fine roots throughout; few very fine tubular pores; neutral; gradual wavy boundary.

Bk—35 to 46 inches; light yellowish brown (2.5Y 6/3) sandy loam, light olive brown (2.5Y 5/3) moist; weak fine subangular blocky structure; soft, very friable; few very fine roots throughout; few very fine tubular pores; 9 percent calcium carbonate equivalent; strongly effervescent; moderately alkaline; gradual wavy boundary.

C1—46 to 65 inches; pale yellow (2.5Y 7/3) loamy sand, light olive brown (2.5Y 5/3) moist; single grain; loose; 6 percent calcium carbonate equivalent; few iron stains throughout; strongly effervescent; 2 percent gravel; moderately alkaline; gradual wavy boundary.

C2—65 to 80 inches; light yellowish brown (2.5Y 6/3) loamy sand, olive brown (2.5Y 4/3) moist; single grain; loose; 6 percent calcium carbonate equivalent; few iron stains throughout; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 20 inches

Depth to carbonates: 18 to 60 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1 or 2

Texture - fine sandy loam but is sandy loam or loam in some pedons

Bw horizon:

Hue - 10YR or 2.5Y; value - 4 to 6 (3 to 5 moist); and chroma - 2 or 3

Texture - sandy loam or fine sandy loam but is loam in some pedons

Bk horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - fine sandy loam, sandy loam, or loam but is loamy fine sand or loamy sand in some pedons

C horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - fine sand, loamy fine sand, loamy sand, or fine sandy loam but is clay loam in some pedons

Holmquist Series

Depth to restrictive feature: None

Drainage class: Poorly drained

Permeability: Moderate

Landform: Flood plains

Parent material: Loamy alluvium

Slope: 0 to 2 percent

Typical Pedon

Holmquist loam, in an area of La Prairie-Holmquist loams, channeled, 150 feet west and 1,000 feet south of the northeast corner of sec. 3, T. 120 N., R. 60 W.; USGS Conde, SD topographic quadrangle; lat. 45 degrees 14 minutes 16 seconds N. and long. 98 degrees 1 minutes 22 seconds W.

A—0 to 3 inches; very dark gray (10YR 3/1) loam, black (10YR 2/1) moist; weak medium subangular blocky structure; slightly hard, friable; common very fine and fine roots throughout; few very fine tubular pores; 5 percent calcium carbonate equivalent; slightly effervescent; slightly alkaline; clear wavy boundary.

Az—3 to 7 inches; very dark gray (10YR 3/1) stratified loam and fine sandy loam, black (10YR 2/1) moist; weak medium subangular blocky structure; slightly hard, friable; common very fine and fine roots throughout; few very fine tubular pores; 8 percent calcium carbonate equivalent; common fine salt masses; slightly effervescent; slightly alkaline; clear wavy boundary.

Cz—7 to 15 inches; grayish brown (2.5Y 5/2) loam, very dark grayish brown (2.5Y 3/2) moist; massive; slightly hard, friable; common very fine roots throughout; common very fine tubular pores; 10 percent calcium carbonate equivalent; few fine and medium soft masses of carbonate and common fine salt masses; strongly effervescent; strongly alkaline; clear wavy boundary.

Cg1—15 to 20 inches; gray (5Y 5/1) clay loam, very dark gray (5Y 3/1) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine tubular pores; 10 percent calcium carbonate equivalent; strongly effervescent; strongly alkaline; abrupt wavy boundary.

Azb—20 to 24 inches; dark gray (2.5Y 4/1) loam, black (2.5Y 2/1) moist; weak fine subangular blocky structure; slightly hard, friable; few very fine roots throughout; few very fine tubular pores; 10 percent calcium carbonate equivalent; few fine soft masses of carbonate and common fine salt masses and few fine nests of gypsum; strongly effervescent; strongly alkaline; clear wavy boundary.

Cg2—24 to 36 inches; olive gray (5Y 5/2) fine sandy loam, dark olive gray (5Y 3/2) moist; massive; soft, very friable; few very fine roots throughout; few very fine tubular pores; 8 percent calcium carbonate equivalent; few fine and medium gypsum crystals; few fine prominent dark yellowish brown (10YR 4/4) redox concentrations and few fine distinct gray (10YR 5/1) redox depletions; slightly effervescent; strongly alkaline; gradual wavy boundary.

Cg3—36 to 80 inches; gray (5Y 5/1) stratified clay loam and sand, very dark gray (5Y 3/1) moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine tubular pores; 7 percent calcium carbonate equivalent; common fine prominent dark yellowish brown (10YR 4/4) redox concentrations and common fine distinct gray (10YR 5/1) redox depletions; strongly effervescent; strongly alkaline.

Range in Characteristics

Depth to carbonates: 0 to 10 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: 0 to 10 inches

Remarks: Some pedons lack an Ab horizon.

A horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 or 3 moist); and chroma - 1 to 3

Texture - loam but is fine sandy loam or sandy loam in some pedons

C horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 3 to 7 (2.5 to 5 moist); and chroma - 1 to 4

Texture - stratified clay loam, loam, fine sandy loam, sandy loam, and sand

Houdek Series

Depth to restrictive feature: None

Drainage class: Well drained

Permeability: Moderately slow

Landform: Till plains

Parent material: Loamy glacial till

Slope: 0 to 9 percent

Typical Pedon

Houdek loam, in an area of Houdek-Stickney complex, 0 to 2 percent slopes, 2,170 feet west and 420 feet north of the southeast corner of sec. 14, T. 114 N., R. 60 W.; USGS Bloomfield, SD topographic quadrangle; lat. 44 degrees 40 minutes 35 seconds N. and long. 98 degrees 0 minutes 21 seconds W.

A—0 to 6 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak fine granular structure; slightly hard, friable; many very fine roots throughout; many very fine tubular pores; neutral; clear smooth boundary.

Bt1—6 to 11 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; common very fine tubular pores; clay films on vertical faces of peds; slightly alkaline; clear smooth boundary.

Bt2—11 to 19 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; common very fine tubular pores; clay films on vertical faces of peds; slightly alkaline; clear smooth boundary.

Bk1—19 to 27 inches; light yellowish brown (2.5Y 6/3) clay loam, olive brown (2.5Y 4/3) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; hard, friable, slightly sticky and slightly plastic; few

very fine roots throughout; many very fine tubular pores; 26 percent calcium carbonate equivalent; common fine and medium soft masses of carbonate; 1 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bk2—27 to 42 inches; light yellowish brown (2.5Y 6/3) clay loam, olive brown (2.5Y 4/3) moist; weak fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; many very fine tubular pores; 25 percent calcium carbonate equivalent; common fine soft masses of carbonate; few fine distinct gray (10YR 5/1) relict redox features; 1 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.

C1—42 to 63 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; very hard, firm, sticky and plastic; few very fine tubular pores; 11 percent calcium carbonate equivalent; few iron stains; few fine soft masses of carbonate, few fine prominent dark yellowish brown (10YR 4/6) and few fine prominent gray (10YR 5/1) relict redox features; 2 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.

C2—63 to 80 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; very hard, firm, sticky and plastic; few very fine tubular pores; 12 percent calcium carbonate equivalent; few iron stains; few fine soft masses of carbonate; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; 2 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 8 to 20 inches

Depth to carbonates: 14 to 24 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 40 inches

A horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 1 or 2

Texture - loam but is silt loam or clay loam in some pedons

Bt horizon:

Hue - 10YR or 2.5Y; value - 4 to 6 (3 to 5 moist); and chroma - 2 or 3

Texture - clay loam

Bk horizon:

Hue - 10YR or 2.5Y; value - 4 to 6 (4 or 5 moist); and chroma - 2 to 4

Texture - clay loam or loam

C horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - loam or clay loam

Hoven Series

Depth to restrictive feature: Natric; top depth ranges from 1 to 6 inches

Drainage class: Poorly drained

Permeability: Very slow

Landform: Till plains

Parent material: Local clayey alluvium

Slope: 0 to 1 percent

Typical Pedon

Hoven silt loam, in an area of Jerauld-Hoven silt loams, 0 to 2 percent slopes, 120 feet east and 2,050 feet south of the northwest corner of sec. 26, T. 114 N., R. 60 W.; USGS Bloomfield, SD topographic quadrangle; lat. 44 degrees 39 minutes 18 seconds N. and long. 98 degrees 1 minute 2 seconds W.

- E—0 to 3 inches; gray (10YR 6/1) silt loam, very dark gray (10YR 3/1) moist; weak thin platy structure; soft, very friable; many very fine and fine roots throughout; common very fine tubular pores; neutral; abrupt smooth boundary.
- Btn1—3 to 6 inches; gray (10YR 5/1) silty clay, very dark gray (10YR 3/1) moist; strong coarse columnar structure; very hard, very firm, sticky and plastic; common very fine roots between peds; few very fine tubular pores; gray (10YR 6/1) coats on tops of columns and clay films on vertical faces of peds; slightly alkaline; clear smooth boundary.
- Btn2—6 to 22 inches; gray (10YR 5/1) silty clay, very dark gray (10YR 3/1) moist; moderate coarse prismatic structure parting to moderate fine and medium angular blocky; very hard, very firm, sticky and plastic; common very fine roots between peds; common very fine tubular pores; clay films on vertical faces of peds; slightly alkaline; gradual wavy boundary.
- Bk1—22 to 43 inches; grayish brown (2.5Y 5/2) silty clay loam, very dark grayish brown (2.5Y 3/2) moist; weak fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few very fine roots between peds; common very fine tubular pores; 8 percent calcium carbonate equivalent; few fine soft masses of carbonate; few fine prominent dark yellowish brown (10YR 4/6) redox concentrations; slightly effervescent; slightly alkaline; gradual wavy boundary.
- Bk2—43 to 51 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine tubular pores; 17 percent calcium carbonate equivalent; common fine soft masses of carbonate; many fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine distinct gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline; gradual wavy boundary.
- Cg—51 to 80 inches; gray (5Y 6/1) clay loam, dark gray (5Y 4/1) moist; massive; very hard, firm, slightly sticky and slightly plastic; few very fine tubular pores; 11 percent calcium carbonate equivalent; few fine soft masses of carbonate; many fine prominent dark yellowish brown (10YR 4/6) redox concentrations and few fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 52 inches

Depth to carbonates: 7 to 32 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: 15 to 60 inches

Remarks: Some pedons have a Btnk horizon.

E horizon:

Hue - 10YR; value - 5 to 7 (2 to 4 moist); and chroma - 1 or 2

Texture - silt loam but is silty clay loam in some pedons

Btn horizon:

Hue - 10YR or 2.5Y; value - 4 or 5 (2 or 3 moist); and chroma - 1 or 2

Texture - clay or silty clay but is clay loam or silty clay loam in some pedons

Bk horizon:

Hue - 10YR or 2.5Y; value - 4 to 6 (3 or 4 moist); and chroma - 1 or 2
Texture - silty clay loam, clay loam, or silty clay

C horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 4 to 7 (3 to 5 moist); and chroma - 1 to 3
Texture - silty clay, silty clay loam, clay loam, or clay

Huffton Series

Depth to restrictive feature: None

Drainage class: Well drained

Permeability: Moderate in the solum and moderate to slow in the underlying material

Landform: Lake plains

Parent material: Silty glaciolacustrine sediments

Slope: 6 to 9 percent

Typical Pedon

Huffton silt loam, in an area of Great Bend-Zell-Huffton silt loams, 4 to 9 percent slopes, 400 feet south and 2,450 feet east of the northwest corner of sec. 14, T. 116 N., R. 62 W.; USGS Glendale Colony, SD topographic quadrangle; lat. 44 degrees 51 minutes 46 seconds N. and long. 98 degrees 15 minutes 4 seconds W.

Ap—0 to 7 inches; dark gray (10YR 4/1) silt loam, very dark gray (10YR 3/1) moist; weak fine granular structure; slightly hard, very friable; few very fine roots throughout; few very fine tubular pores; 7 percent calcium carbonate equivalent; strongly effervescent; slightly alkaline; abrupt smooth boundary.

Bk—7 to 12 inches; light gray (2.5Y 7/2) silt loam, grayish brown (2.5Y 5/2) moist; weak fine and medium subangular blocky structure; slightly hard, very friable; few very fine roots throughout; common very fine tubular pores; 24 percent calcium carbonate equivalent; strongly effervescent; slightly alkaline; clear smooth boundary.

Bk_{yz1}—12 to 18 inches; light gray (2.5Y 7/2) silt loam, grayish brown (2.5Y 5/2) moist; weak fine and medium subangular blocky structure; slightly hard, very friable; few very fine roots throughout; common very fine tubular pores; 19 percent calcium carbonate equivalent; many fine nests of gypsum and common fine salt masses; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bk_{yz2}—18 to 28 inches; pale yellow (2.5Y 7/3) silt loam, light olive brown (2.5Y 5/3) moist; weak fine and medium subangular blocky structure; slightly hard, very friable; common very fine tubular pores; 15 percent calcium carbonate equivalent; many fine nests of gypsum and few fine salt masses; strongly effervescent; moderately alkaline; gradual wavy boundary.

C1—28 to 48 inches; pale yellow (2.5Y 7/4) silt loam, light olive brown (2.5Y 5/4) moist; massive; slightly hard, very friable; few very fine tubular pores; varved with very fine sand to clay; 7 percent calcium carbonate equivalent; few fine prominent gray (10YR 5/1) relict redox features; slightly effervescent; moderately alkaline; gradual wavy boundary.

C2—48 to 80 inches; pale yellow (2.5Y 7/4) silt loam, light olive brown (2.5Y 5/4) moist; massive; slightly hard, very friable; common very fine tubular pores; varved with very fine sand to clay; 7 percent calcium carbonate equivalent; common fine prominent gray (10YR 5/1) and common fine prominent yellowish brown (10YR 5/6) relict redox features; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches

Depth to carbonates: 0 to 10 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: 6 to 35 inches

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1 or 2

Texture - silt loam but is very fine sandy loam or loam in some pedons

Bk or Bk_{yz} horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (3 to 6 moist); and chroma - 2 to 4

Texture - silt loam, loam, or very fine sandy loam

C horizon:

Hue - 2.5Y; value - 6 to 8 (4 to 6 moist); and chroma - 2 to 4

Texture - silt loam, loam, or very fine sandy loam and typically is varved with very fine sand to clay in the lower part

Ip_{age} Series

Depth to restrictive feature: None

Drainage class: Moderately well drained

Permeability: Rapid in the sandy sediments and moderately slow in the underlying glacial till

Landform: Till plains

Parent material: Sandy glaciofluvial sediments over loamy glacial till

Slope: 2 to 6 percent

Typical Pedon

Ip_{age} fine sand, in an area of Ip_{age}-Els-Shue complex, 0 to 6 percent slopes, 2,500 feet north and 1,850 feet west of the southeast corner of sec. 19, T. 114 N., R. 63 W.; USGS Hitchcock, SD topographic quadrangle; lat. 44 degrees 40 minutes 9 seconds N. and long. 98 degrees 27 minutes 1 second W.

A—0 to 6 inches; dark grayish brown (10YR 4/2) fine sand, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; loose; many very fine roots throughout; neutral; clear smooth boundary.

C1—6 to 15 inches; grayish brown (10YR 5/2) fine sand, very dark grayish brown (10YR 3/2) moist; single grain; loose; common very fine roots throughout; less than 0.6 percent organic carbon; neutral; gradual wavy boundary.

C2—15 to 31 inches; grayish brown (10YR 5/2) fine sand, very dark grayish brown (10YR 3/2) moist; single grain; loose; few very fine roots throughout; less than 0.6 percent organic carbon; neutral; clear wavy boundary.

Ab—31 to 38 inches; dark gray (10YR 4/1) loamy fine sand, black (10YR 2/1) moist; single grain; loose; neutral; clear wavy boundary.

C3—38 to 61 inches; light yellowish brown (2.5Y 6/3) fine sand, olive brown (2.5Y 4/3) moist; single grain; loose; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations; neutral; clear wavy boundary.

2C4—61 to 80 inches; pale yellow (2.5Y 7/3) clay loam, light olive brown (2.5Y 5/3) moist; massive; very hard, firm, sticky and plastic; few very fine tubular pores; 11 percent calcium carbonate equivalent; few fine and medium soft masses of carbonate and few fine soft masses of iron-manganese; many fine and medium

prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine prominent gray (10YR 6/1) redox depletions; 1 percent pebbles; strongly effervescent; slightly alkaline.

Range in Characteristics

Depth to carbonates: 60 to 80 inches

Depth to contrasting parent material: Greater than 60 inches over glacial till

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

Remarks: Some pedons have an AC horizon. Some pedons lack an Ab horizon.

A horizon:

Hue - 10YR; value - 4 to 6 (3 or 4 moist); and chroma - 1 to 3

Texture - fine sand but is sand, loamy sand, or loamy fine sand in some pedons

C horizon:

Hue - 10YR or 2.5Y; value - 4 to 8 (3 to 7 moist); and chroma - 2 or 3; organic carbon content < 0.6%

Texture - fine sand, sand, loamy sand, or loamy fine sand

2C horizon:

Hue - 10YR or 2.5Y; value - 6 to 8 (4 to 7 moist); and chroma - 2 or 3

Texture - clay loam or loam

Jerauld Series

Depth to restrictive feature: Natric; top depth ranges from 1 to 5 inches

Drainage class: Moderately well and somewhat poorly drained

Permeability: Very slow

Landform: Till plains

Parent material: Loamy glacial till

Slope: 0 to 2 percent

Typical Pedon

Jerauld silt loam, in an area of Dudley-Jerauld silt loams, 0 to 2 percent slopes, 260 feet west and 1,220 feet north of the southeast corner of sec. 27, T. 114 N., R. 60 W.; USGS Bloomfield, SD topographic quadrangle; lat. 44 degrees 38 minutes 58 seconds N. and long. 98 degrees 1 minute 10 seconds W.

E—0 to 2 inches; gray (10YR 5/1) silt loam, very dark gray (10YR 3/1) moist; weak thin platy structure parting to weak fine granular; slightly hard, friable; many very fine and fine roots throughout; common very fine tubular pores; neutral; abrupt wavy boundary.

Btn1—2 to 5 inches; dark gray (10YR 4/1) clay loam, black (10YR 2/1) moist; strong medium columnar structure; very hard, very firm, sticky and plastic; common very fine roots between peds; few very fine tubular pores; gray (10YR 6/1) coats on tops of columns and clay films on vertical faces of peds; slightly alkaline; abrupt smooth boundary.

Btn2—5 to 14 inches; dark gray (10YR 4/1) clay loam, very dark gray (10YR 3/1) moist; moderate coarse prismatic structure parting to moderate medium angular blocky; very hard, very firm, sticky and plastic; common very fine roots between peds; few very fine tubular pores; clay films on vertical faces of peds; slightly alkaline; clear wavy boundary.

- Bkz1—14 to 33 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure parting to weak fine and medium subangular blocky; hard, firm, sticky and plastic; few very fine tubular pores; 18 percent calcium carbonate equivalent; common fine salt masses and common fine soft masses of carbonate and common fine and medium nests of gypsum; strongly effervescent; moderately alkaline; gradual wavy boundary.
- Bkz2—33 to 41 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure parting to weak fine and medium subangular blocky; hard, firm, sticky and plastic; common very fine tubular pores; 17 percent calcium carbonate equivalent; common fine salt masses and common fine nests of gypsum and common fine soft masses of carbonate; few fine prominent dark yellowish brown (10YR 4/6) redox concentrations and few fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C1—41 to 61 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; very hard, firm, sticky and plastic; few very fine tubular pores; 11 percent calcium carbonate equivalent; few fine soft masses of carbonate and few fine nests of gypsum; few fine prominent dark yellowish brown (10YR 4/6) redox concentrations and few fine distinct gray (10YR 5/1) redox depletions; 1 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C2—61 to 80 inches; gray (2.5Y 6/1) clay loam, dark gray (2.5Y 4/1) moist; massive; very hard, firm, sticky and plastic; few very fine tubular pores; 10 percent calcium carbonate equivalent; few fine nests of gypsum; many medium prominent dark yellowish brown (10YR 4/6) redox concentrations; 1 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 27 inches

Depth to carbonates: 6 to 25 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: 1 to 16 inches

Remarks: Some pedons have an A horizon.

E horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (3 to 5 moist); and chroma - 1 or 2

Texture - silt loam but is silty clay loam or loam in some pedons

Btn horizon:

Hue - 10YR or 2.5Y; value - 4 or 5 (2 or 3 moist); and chroma - 1 or 2

Texture - clay loam, clay, or silty clay

Bkz horizon:

Hue - 10YR or 2.5Y; value - 4 to 6 (3 to 5 moist); and chroma - 1 to 3

Texture - clay loam, clay, or silty clay

C horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 1 to 4

Texture - silty clay loam, silty clay, clay, or clay loam

Kranzburg Series

Depth to restrictive feature: None

Drainage class: Well drained

Permeability: Moderately slow

Landform: Till plains

Parent material: Loess over loamy glacial till

Slope: 0 to 6 percent

Typical Pedon

Kranzburg silt loam (fig. 24), in an area of Kranzburg-Brookings silt loams, 0 to 2 percent slopes, 325 feet north and 2,100 feet west of the southeast corner of sec. 8, T. 118 N., R. 60 W.; USGS Turton, SD topographic quadrangle; lat. 45 degrees 2 minutes 20 seconds N. and long. 98 degrees 4 minutes 18 seconds W.

Ap—0 to 7 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; weak fine granular structure; slightly hard, friable; many very fine roots throughout; common very fine tubular pores; neutral; abrupt smooth boundary.

Bw1—7 to 14 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; common very fine tubular pores; slightly alkaline; clear smooth boundary.

Bk1—14 to 26 inches; pale yellow (2.5Y 7/3) silt loam, light olive brown (2.5Y 5/3) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; many very fine tubular pores; 22 percent calcium carbonate equivalent; common fine soft masses of carbonate; strongly effervescent; moderately alkaline; clear wavy boundary.

2Bk2—26 to 36 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; many very fine tubular pores; 18 percent calcium carbonate equivalent; common fine and medium soft masses of carbonate; 2 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.

2C1—36 to 52 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, friable, slightly sticky and slightly plastic; common very fine tubular pores; 14 percent calcium carbonate equivalent; few fine soft masses of carbonate, few fine prominent gray (10YR 5/1) relict redox features; 2 percent pebbles; strongly effervescent; strongly alkaline; gradual wavy boundary.

2C2—52 to 80 inches; light yellowish brown (2.5Y 6/3) clay loam, olive brown (2.5Y 4/3) moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine tubular pores; 14 percent calcium carbonate equivalent, common fine prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine and medium prominent gray (10YR 5/1) redox depletions; 2 percent pebbles; strongly effervescent; strongly alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches

Depth to carbonates: 14 to 36 inches

Depth to contrasting parent material: 20 to 40 inches over glacial till

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

Remarks: Some pedons lack a Bk horizon.

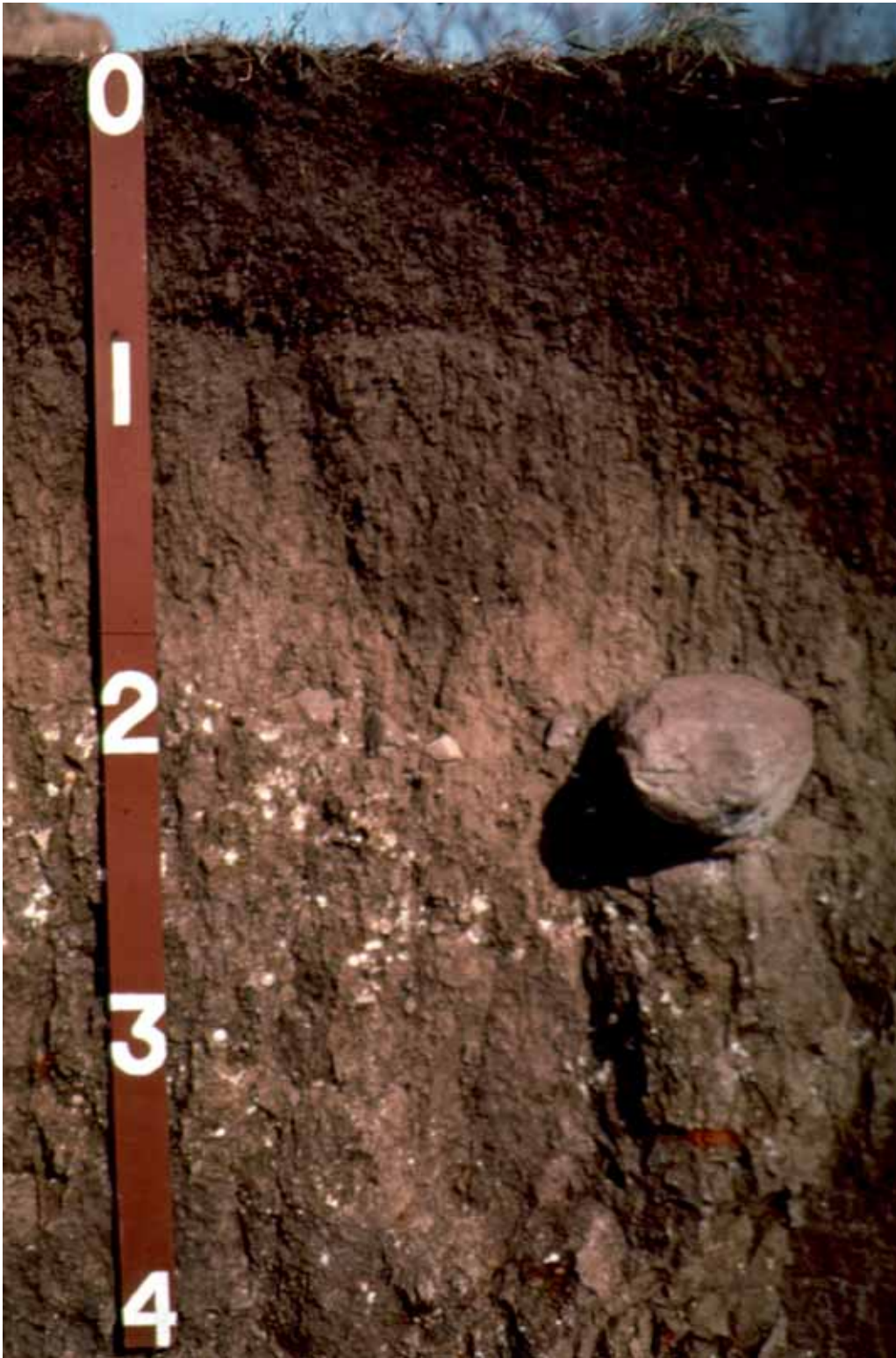


Figure 24. Profile of Kranzburg silt loam. There is about 24 inches of silt loam material over the clay loam glacial till. Depth is marked in feet.

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1
Texture - silt loam but is silty clay loam in some pedons

Bw horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 to 4 moist); and chroma - 2 or 3
Texture - silt loam but is silty clay loam in some pedons

Bk horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4
Texture - silt loam or silty clay loam

2Bk horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4
Texture - clay loam or loam

2C horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4
Texture - clay loam or loam

La Prairie Series

Depth to restrictive feature: None

Drainage class: Moderately well drained

Permeability: Moderate

Landform: Flood plains

Parent material: Loamy alluvium

Slope: 0 to 2 percent

Typical Pedon

La Prairie loam, in an area of La Prairie-Holmquist loams, channeled, 200 feet east and 1,200 feet north of the southwest corner of sec. 3, T. 120 N., R. 60 W.; USGS Conde, SD topographic quadrangle; lat. 45 degrees 13 minutes 45 seconds N. and long. 98 degrees 2 minutes 30 seconds W.

A1—0 to 13 inches; very dark gray (10YR 3/1) loam, black (10YR 2/1) moist; weak medium subangular blocky structure parting to weak fine and medium granular; slightly hard, friable; many very fine and fine roots throughout; few very fine tubular pores; slightly alkaline; clear wavy boundary.

A2—13 to 24 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; moderate medium subangular blocky structure; slightly hard, friable; common very fine and fine roots throughout; few very fine tubular pores; slightly alkaline; clear wavy boundary.

Bw—24 to 33 inches; brown (10YR 4/3) loam, dark brown (10YR 3/3) moist; weak medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable; few very fine roots throughout; few very fine tubular pores; moderately alkaline; clear wavy boundary.

Bk—33 to 44 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; moderate medium and coarse subangular blocky structure; slightly hard, friable; few very fine tubular pores; 24 percent calcium carbonate equivalent; common fine and medium soft masses of carbonate; strongly effervescent; strongly alkaline; clear wavy boundary.

C—44 to 80 inches; light olive brown (2.5Y 5/3) stratified loamy sand and clay loam, olive brown (2.5Y 4/3) moist; massive; soft, very friable; few very fine tubular pores; 10 percent calcium carbonate equivalent; few fine soft masses of carbonate; few fine faint grayish brown (2.5Y 5/2) redox depletions; 1 percent gravel; slightly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 to 50 inches

Depth to carbonates: 0 to 40 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR or neutral; value - 3 or 4 (2 or 3 moist); and chroma - 0 or 1

Texture - loam but is silt loam or clay loam in some pedons

Bw horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 to 4 moist); and chroma - 1 to 3

Texture - loam, clay loam, or silt loam

Bk horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 4 to 7 (3 to 5 moist); and chroma - 1 to 4

Texture - loam, clay loam, silt loam, or silty clay loam

C horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 4 to 7 (3 to 5 moist); and chroma - 1 to 4

Texture - stratified loamy sand, sandy loam, loam, or clay loam but is silt loam or silty clay loam in some pedons

LaDelle Series

Depth to restrictive feature: None

Drainage class: Moderately well drained

Permeability: Moderate

Landform: Flood plains

Parent material: Silty alluvium

Slope: 0 to 2 percent

Typical Pedon

LaDelle silt loam, 0 to 2 percent slopes, 400 feet east and 1,150 feet north of the southwest corner of sec. 17, T. 117 N., R. 62 W.; USGS Frankfort, SD topographic quadrangle; lat. 44 degrees 56 minutes 30 seconds N. and long. 98 degrees 19 minutes 35 seconds W.

Ap—0 to 8 inches; dark gray (10YR 4/1) silt loam, very dark gray (10YR 3/1) moist; weak fine and medium granular structure; soft, very friable; common very fine roots throughout; common very fine tubular pores; 7 percent calcium carbonate equivalent; slightly effervescent; neutral; abrupt smooth boundary.

A—8 to 19 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; weak fine subangular blocky structure parting to weak fine and medium granular; slightly hard, very friable; common very fine roots throughout; common very fine tubular pores; 7 percent calcium carbonate equivalent; slightly effervescent; neutral; clear smooth boundary.

AB—19 to 27 inches; gray (10YR 5/1) silt loam, very dark gray (10YR 3/1) moist; weak fine and medium subangular blocky structure; slightly hard, friable; few very fine roots throughout; common very fine tubular pores; 12 percent calcium carbonate equivalent; common fine soft masses of carbonate; strongly effervescent; moderately alkaline; clear wavy boundary.

Bk—27 to 38 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; slightly

hard, friable; few very fine roots throughout; common very fine tubular pores; 12 percent calcium carbonate equivalent; common fine soft masses of carbonate; strongly effervescent; moderately alkaline; clear wavy boundary.

Ab1—38 to 48 inches; gray (10YR 5/1) silt loam, very dark gray (10YR 3/1) moist; weak fine subangular blocky structure; slightly hard, friable; few very fine roots throughout; many very fine tubular pores; 8 percent calcium carbonate equivalent; few fine soft masses of carbonate; strongly effervescent; moderately alkaline; gradual wavy boundary.

C1—48 to 66 inches; light brownish gray (10YR 6/2) silty clay loam, dark grayish brown (10YR 4/2) moist; massive; hard, friable, slightly sticky and slightly plastic; many very fine tubular pores; 9 percent calcium carbonate equivalent; few fine soft masses of carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.

Ab2—66 to 74 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; weak fine subangular blocky structure; slightly hard, friable; common very fine tubular pores; 7 percent calcium carbonate equivalent; slightly effervescent; neutral; clear wavy boundary.

C2—74 to 80 inches; light brownish gray (2.5Y 6/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, friable, slightly sticky and slightly plastic; common very fine tubular pores; 8 percent calcium carbonate equivalent; few fine faint gray (10YR 5/1) redox depletions; slightly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 17 to 50 inches

Depth to carbonates: 0 to greater than 60 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 20 inches

A horizon:

Hue - 10YR or neutral; value - 3 or 4 (2 or 3 moist); and chroma - 0 or 1

Texture - silt loam but is silty clay loam in some pedons

Bk horizon:

Hue - 10YR or 2.5Y; value - 3 to 6 (2 to 5 moist); and chroma - 1 to 3

Texture - silt loam or silty clay loam

Ab horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 or 3 moist); and chroma - 1 or 2

Texture - silt loam but is silty clay loam in some pedons

C horizon:

Hue - 10YR or 2.5Y; value - 3 to 7 (2 to 5 moist); and chroma - 1 to 4

Texture - stratified silt loam, silty clay loam, or clay loam

Lamo Series

Depth to restrictive feature: None

Drainage class: Somewhat poorly drained

Permeability: Moderately slow

Landform: Flood plains

Parent material: Silty alluvium

Slope: 0 to 1 percent

Typical Pedon

Lamo silty clay loam, 0 to 1 percent slopes, 950 feet west and 1,200 feet north of the southeast corner of sec. 33, T. 114 N., R. 65 W.; USGS Tulare NW, SD topographic quadrangle; lat. 44 degrees 38 minutes 13 seconds N. and long. 98 degrees 38 minutes 58 seconds W.

Ap—0 to 8 inches; dark gray (10YR 4/1) silty clay loam, black (10YR 2/1) moist; weak fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine tubular pores; 4 percent calcium carbonate equivalent; slightly effervescent; neutral; abrupt smooth boundary.

A1—8 to 17 inches; very dark gray (10YR 3/1) silty clay loam, black (10YR 2/1) moist; weak fine and medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine tubular pores; 8 percent calcium carbonate equivalent; strongly effervescent; slightly alkaline; clear wavy boundary.

A2—17 to 22 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; weak fine and medium granular structure; slightly hard, friable; common very fine tubular pores; 6 percent calcium carbonate equivalent; strongly effervescent; neutral; clear wavy boundary.

AC—22 to 30 inches; grayish brown (2.5Y 5/2) silt loam, very dark grayish brown (2.5Y 3/2) moist; massive; slightly hard, friable; common very fine tubular pores; 10 percent calcium carbonate equivalent; strongly effervescent; moderately alkaline; gradual wavy boundary.

C1—30 to 47 inches; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard, friable; common very fine tubular pores; 11 percent calcium carbonate equivalent; few fine distinct gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline; gradual wavy boundary.

C2—47 to 80 inches; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard, friable; common very fine tubular pores; 11 percent calcium carbonate equivalent; few fine distinct yellowish brown (10YR 5/4) redox concentrations and few fine distinct gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: Greater than 24 inches

Depth to carbonates: 0 to 10 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 or 3 moist); and chroma - 1 or 2

Texture - silty clay loam but is silt loam in some pedons

C horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 5 to 7 (3 to 6 moist); and chroma - 1 or 2

Texture - silt loam or silty clay loam

Lamoure Series

Depth to restrictive feature: None

Drainage class: Somewhat poorly and poorly drained

Permeability: Moderately slow

Landform: Flood plains

Parent material: Silty alluvium

Slope: 0 to 1 percent

Typical Pedon

Lamoure silty clay loam (fig. 25), 0 to 1 percent slopes, 2,300 feet east and 550 feet south of the northwest corner of sec. 27, T. 120 N., R. 63 W.; USGS Mellette, SD topographic quadrangle; lat. 45 degrees 11 minutes 2 seconds N. and long. 98 degrees 24 minutes 6 seconds W.

- Ap—0 to 8 inches; dark gray (10YR 4/1) silty clay loam, black (10YR 2/1) moist; weak fine granular structure; hard, friable, slightly sticky and slightly plastic; many very fine and fine roots throughout; common very fine and fine tubular pores; 6 percent calcium carbonate equivalent; strongly effervescent; moderately alkaline; abrupt smooth boundary.
- A1—8 to 19 inches; gray (10YR 5/1) silty clay loam, very dark gray (10YR 3/1) moist; weak fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; many very fine and fine roots throughout; common very fine and fine tubular pores; 9 percent calcium carbonate equivalent; common fine soft masses of carbonate; strongly effervescent; strongly alkaline; clear wavy boundary.
- A2—19 to 38 inches; gray (10YR 5/1) silty clay loam, very dark gray (10YR 3/1) moist; weak fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; common very fine and fine tubular pores; 10 percent calcium carbonate equivalent; common fine soft masses of carbonate; few fine prominent dark yellowish brown (10YR 4/6) redox concentrations; strongly effervescent; strongly alkaline; clear wavy boundary.
- Cg1—38 to 55 inches; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine tubular pores; 11 percent calcium carbonate equivalent; common manganese or iron-manganese stains throughout; common fine soft masses of carbonate; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations; strongly effervescent; strongly alkaline; gradual wavy boundary.
- Cg2—55 to 80 inches; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; 10 percent calcium carbonate equivalent; common manganese or iron-manganese stains throughout; many fine prominent dark yellowish brown (10YR 4/6) redox concentrations and few fine faint gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: Greater than 24 inches

Depth to carbonates: 0 to 10 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

Remarks: Some pedons have an Ab horizon.

A horizon:

Hue - 10YR, 2.5Y, 5Y, or neutral; value - 3 to 5 (2 or 3 moist); and chroma - 0 or 1
Texture - silty clay loam but is silt loam in some pedons



Figure 25. Profile of Lamoure silty clay loam. Calcium carbonate is located throughout the profile. This is a poorly drained soil. Depth is marked in feet.

Cg horizon:

Hue - 2.5Y, 5Y, or neutral; value - 4 to 8 (2 to 6 moist); and chroma - 0 to 2
Texture - silty clay loam or silt loam

Langhei Series

Depth to restrictive feature: None

Drainage class: Well drained

Permeability: Moderately slow

Landform: Moraines

Parent material: Loamy glacial till

Slope: 15 to 40 percent

Typical Pedon

Langhei clay loam, in an area of Buse-Langhei complex, 15 to 40 percent slopes, 550 feet west and 1,925 feet north of the southeast corner of sec. 12, T. 115 N., R. 61 W.; USGS Doland SE, SD topographic quadrangle; lat. 44 degrees 46 minutes 55 seconds N. and long. 98 degrees 6 minutes 4 seconds W.

- A—0 to 4 inches; dark gray (10YR 4/1) clay loam, black (10YR 2/1) moist; weak fine subangular blocky structure parting to weak fine granular; slightly hard, friable; many very fine roots throughout; common very fine tubular pores; 7 percent calcium carbonate equivalent; 5 percent pebbles; slightly effervescent; moderately alkaline; abrupt smooth boundary.
- Bk—4 to 15 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable; common very fine roots throughout; common very fine tubular pores; 22 percent calcium carbonate equivalent; few fine soft masses of carbonate; 10 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C1—15 to 55 inches; light yellowish brown (2.5Y 6/3) loam, olive brown (2.5Y 4/3) moist; massive; slightly hard, friable; common very fine tubular pores; 15 percent calcium carbonate equivalent; few fine soft masses of carbonate, few fine distinct gray (10YR 5/1) redox depletions; 10 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C2—55 to 80 inches; pale yellow (2.5Y 7/3) clay loam, light olive brown (2.5Y 5/3) moist; few fine distinct gray (10YR 5/1) massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine tubular pores; 16 percent calcium carbonate equivalent; few fine soft masses of carbonate and few fine soft masses of iron-manganese, common fine prominent dark yellowish brown (10YR 4/6) redox concentrations; 5 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 0 to 5 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR or 2.5Y; value - 4 to 7 (2 to 5 moist); and chroma - 1 or 2
Texture - clay loam but is loam in some pedons

Bk horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4
Texture - loam or clay loam

C horizon:

Hue - 10YR or 2.5Y; value - 5 to 8 (4 to 7 moist); and chroma - 2 to 4
Texture - loam or clay loam

Lawet Series

Depth to restrictive feature: None

Drainage class: Poorly and very poorly drained

Permeability: Moderately slow

Landform: Flood plains

Parent material: Loamy alluvium

Slope: 0 to 2 percent

Typical Pedon

Lawet loam, in an area of Lawet-Davison loams, 0 to 2 percent slopes, 400 feet east and 1,750 feet north of the southwest corner of sec. 35, T. 115 N., R. 64 W.; USGS Tulare, SD topographic quadrangle; lat. 44 degrees 43 minutes 30 seconds N. and long. 98 degrees 30 minutes 7 seconds W.

A—0 to 8 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; moderate fine granular structure; slightly hard, friable; common very fine and fine roots throughout; few very fine tubular pores; 6 percent calcium carbonate equivalent; slightly effervescent; slightly alkaline; abrupt smooth boundary.

ABk—8 to 16 inches; grayish brown (10YR 5/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure parting to weak fine and medium granular; slightly hard, friable; common very fine roots throughout; few very fine tubular pores; 8 percent calcium carbonate equivalent; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations; strongly effervescent; moderately alkaline; clear smooth boundary.

Bk—16 to 26 inches; light gray (2.5Y 7/2) loam, grayish brown (2.5Y 5/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable; few very fine roots throughout; few very fine tubular pores; 21 percent calcium carbonate equivalent; common fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine distinct gray (10YR 5/1) redox depletions; violently effervescent; moderately alkaline; gradual wavy boundary.

Bkg1—26 to 38 inches; light brownish gray (2.5Y 6/2) loam, grayish brown (2.5Y 5/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable; few very fine roots throughout; few very fine tubular pores; 15 percent calcium carbonate equivalent; common fine and medium soft masses of carbonate; many fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine distinct gray (10YR 5/1) redox depletions; violently effervescent; moderately alkaline; gradual wavy boundary.

Bkg2—38 to 51 inches; grayish brown (2.5Y 5/2) loam, dark grayish brown (2.5Y 4/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable; few very fine tubular pores; 10 percent calcium carbonate equivalent; common fine soft masses of carbonate; many fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine distinct gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline; gradual wavy boundary.

Cg—51 to 80 inches; gray (5Y 6/1) loam, dark gray (5Y 4/1) moist; massive; slightly hard, friable; few very fine tubular pores; 10 percent calcium carbonate equivalent; few fine soft masses of iron-manganese; common fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine and medium prominent gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 24 inches

Depth to carbonates: At the surface

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR, 2.5Y, or neutral; value - 3 to 5 (2 or 3 moist); and chroma - 0 to 1
Texture - loam but is very fine sandy loam or fine sandy loam in some pedons

Bk horizon:

Hue - 10YR, 2.5Y, 5Y, or neutral; value - 5 to 7 (4 or 5 moist); and chroma - 0 to 2
Texture - sandy clay loam, clay loam, loam, or very fine sandy loam

Cg horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (4 to 7 moist); and chroma - 0 to 2
Texture - sandy clay loam, loam, clay loam, sandy loam, or very fine sandy loam

Lehr Series

Depth to restrictive feature: Strongly contrasting textural stratification; top depth ranges from 14 to 20 inches

Drainage class: Somewhat excessively drained

Permeability: Moderate in the loamy sediments and very rapid in the underlying gravelly material

Landform: Outwash plains

Parent material: Loamy alluvium over glacial outwash

Slope: 0 to 6 percent

Typical Pedon

Lehr loam, in an area of Lehr-Bowdle loams, 0 to 3 percent slopes, 2,620 feet east and 1,050 feet south of the northwest corner of sec. 19, T. 117 N., R. 65 W.; USGS Zell, SD topographic quadrangle; lat. 44 degrees 56 minutes 0 seconds N. and long. 98 degrees 42 minutes 44 seconds W.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) loam, very dark brown (10YR 2/2) moist; weak fine and medium granular structure; slightly hard, friable; few very fine roots throughout; few very fine and fine tubular pores; neutral; abrupt smooth boundary.

Bw—7 to 14 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to weak fine and medium subangular blocky; slightly hard, friable; few very fine roots throughout; common very fine and fine tubular pores; slightly alkaline; clear wavy boundary.

Bk—14 to 19 inches; grayish brown (2.5Y 5/2) loam, dark grayish brown (2.5Y 4/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable; few very fine roots throughout; few very fine and fine tubular pores; 12 percent

calcium carbonate equivalent; common fine and medium soft masses of carbonate; 5 percent gravel; strongly effervescent; moderately alkaline; clear wavy boundary.

2C1—19 to 50 inches; light brownish gray (2.5Y 6/2) gravelly loamy sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose; 10 percent calcium carbonate equivalent; carbonate coats on sand and gravel; 30 percent gravel; strongly effervescent; moderately alkaline; gradual wavy boundary.

2C2—50 to 80 inches; light yellowish brown (2.5Y 6/3) very gravelly loamy sand, olive brown (2.5Y 4/3) moist; single grain; loose; 10 percent calcium carbonate equivalent; carbonate coats on sand and gravel; 50 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches

Depth to carbonates: 10 to 20 inches

Depth to contrasting parent material: 14 to 20 inches over gravelly material

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

Remarks: Some pedons have a 2Bk horizon.

A horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 2 or 3

Texture - loam but is sandy loam in some pedons

Bw horizon:

Hue - 10YR or 2.5Y; value - 4 to 6 (2 to 5 moist); and chroma - 2 to 4

Texture - loam but is clay loam or sandy clay loam in some pedons

Bk horizon:

Hue - 10YR or 2.5Y; value - 5 to 8 (3 to 6 moist); and chroma - 1 to 4

Texture - loam

2C horizon:

Hue - 10YR or 2.5Y; value - 5 to 8 (4 to 6 moist); and chroma - 2 to 4

Texture - gravelly loamy sand, very gravelly loamy sand, or loamy coarse sand but is gravelly loamy coarse sand, coarse sand, or gravelly coarse sand in some pedons

Lowe Series

Depth to restrictive feature: None

Drainage class: Poorly drained

Permeability: Moderate

Landform: Flood plains

Parent material: Loamy alluvium

Slope: 0 to 1 percent

Typical Pedon

Lowe loam, 0 to 1 percent slopes, 780 feet east and 245 feet south of the northwest corner of sec. 15, T. 119 N., R. 60 W.; USGS Turton, SD topographic quadrangle; lat. 45 degrees 7 minutes 24 seconds N. and long. 98 degrees 2 minutes 23 seconds W.

Ap—0 to 7 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak medium granular structure; slightly hard, friable, slightly sticky and slightly plastic;

common very fine and fine roots throughout; common very fine tubular pores; 8 percent calcium carbonate equivalent; slightly effervescent; slightly alkaline; abrupt smooth boundary.

Bk1—7 to 16 inches; gray (10YR 5/1) loam, very dark gray (10YR 3/1) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots throughout; common very fine tubular pores; 22 percent calcium carbonate equivalent; violently effervescent; moderately alkaline; clear wavy boundary.

Bk2—16 to 25 inches; light gray (2.5Y 7/2) loam, grayish brown (2.5Y 5/2) moist; weak medium and coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine tubular pores; 24 percent calcium carbonate equivalent; few fine gypsum crystals; few fine distinct olive brown (2.5Y 4/4) redox concentrations; violently effervescent; moderately alkaline; gradual smooth boundary.

Bk3—25 to 34 inches; light gray (2.5Y 7/2) loam, grayish brown (2.5Y 5/2) moist; weak coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine tubular pores; 28 percent calcium carbonate equivalent; few fine and medium distinct olive brown (2.5Y 4/4) redox concentrations; violently effervescent; moderately alkaline; gradual smooth boundary.

Cg1—34 to 50 inches; light gray (5Y 7/2) clay loam, olive gray (5Y 5/2) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; few very fine tubular pores; 8 percent calcium carbonate equivalent; common fine soft masses of iron-manganese; common fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations; slightly effervescent; moderately alkaline; gradual smooth boundary.

Cg2—50 to 80 inches; light gray (5Y 7/2) stratified loam and fine sandy loam, olive gray (5Y 5/2) moist; massive; slightly hard, friable; few very fine tubular pores; 7 percent calcium carbonate equivalent; very few iron stains; common fine soft masses of iron-manganese; common fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations; slightly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 36 inches

Depth to carbonates: 0 to 10 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 15 inches

Remarks: Some pedons have an Ab horizon.

A horizon:

Hue - 10YR, 2.5Y, 5Y, or neutral; value - 3 or 4 (2 or 3 moist); and chroma - 0 or 1

Texture - loam but is clay loam or silt loam in some pedons

Bk or Bkg horizon:

Hue - 10YR, 2.5Y, 5Y, or neutral; value - 3 to 7 (2 to 5 moist); and chroma - 0 to 2

Texture - loam or clay loam but is silt loam in some pedons

Cg horizon:

Hue - 2.5Y or 5Y; value - 4 to 7 (3 to 6 moist); and chroma - 1 to 3

Texture - stratified loam, clay loam, or sandy loam but is stratified silty clay loam, sandy clay loam, or loamy sand in some pedons

Ludden Series

Depth to restrictive feature: None

Drainage class: Poorly and very poorly drained

Permeability: Slow

Landform: Flood plains

Parent material: Clayey alluvium

Slope: 0 to 1 percent

Typical Pedon

Ludden silty clay, 0 to 1 percent slopes, 630 feet east and 790 feet south of the northwest corner of sec. 20, T. 116 N., R. 60 W.; USGS Doland SE, SD topographic quadrangle; lat. 44 degrees 50 minutes 50 seconds N. and long. 98 degrees 4 minutes 32 seconds W.

- A1—0 to 7 inches; very dark gray (10YR 3/1) silty clay, black (10YR 2/1) moist; moderate medium subangular blocky structure; extremely hard, firm, sticky and plastic; many very fine roots throughout; few very fine tubular pores; 7 percent calcium carbonate equivalent; slightly effervescent; slightly alkaline; clear smooth boundary.
- A2—7 to 14 inches; very dark gray (10YR 3/1) silty clay, black (10YR 2/1) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; extremely hard, very firm, sticky and plastic; common very fine roots between peds; few very fine tubular pores; 7 percent calcium carbonate equivalent; slightly effervescent; moderately alkaline; clear smooth boundary.
- Bss—14 to 26 inches; dark gray (10YR 4/1) clay, very dark gray (10YR 3/1) moist; moderate medium and coarse prismatic structure parting to moderate fine and medium angular blocky; extremely hard, very firm, very sticky and very plastic; few very fine roots between peds; few very fine tubular pores; few intersecting slickensides on vertical and horizontal faces of peds; 8 percent calcium carbonate equivalent; few fine salt masses; slightly effervescent; moderately alkaline; clear wavy boundary.
- Bssy—26 to 41 inches; gray (5Y 5/1) clay, very dark gray (5Y 3/1) moist; moderate medium and coarse prismatic structure parting to moderate fine and medium angular blocky; extremely hard, very firm, very sticky and very plastic; few very fine tubular pores; few intersecting slickensides on vertical and horizontal faces of peds; 8 percent calcium carbonate equivalent; many fine and medium nests of gypsum; strongly effervescent; moderately alkaline; gradual wavy boundary.
- Bkyg—41 to 52 inches; gray (5Y 6/1) silty clay, dark gray (5Y 4/1) moist; weak fine and medium prismatic structure; very hard, firm, sticky and plastic; few very fine tubular pores; 19 percent calcium carbonate equivalent; common fine nests of gypsum; few fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline; gradual wavy boundary.
- Cg1—52 to 67 inches; light gray (5Y 7/2) silty clay, olive gray (5Y 5/2) moist; massive; very hard, firm, sticky and plastic; few very fine tubular pores; 16 percent calcium carbonate equivalent; common fine nests of gypsum and few fine soft masses of iron-manganese; common fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline; gradual wavy boundary.
- Cg2—67 to 80 inches; light gray (5Y 7/2) silty clay, olive gray (5Y 5/2) moist; massive; very hard, firm, sticky and plastic; few very fine tubular pores; 11 percent calcium carbonate equivalent; few fine soft masses of iron-manganese; many fine and medium prominent dark yellowish brown (10YR 4/6) redox

concentrations and common fine and medium prominent gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 0 to 10 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: 10 to 30 inches

A horizon:

Hue - 10YR, 2.5Y, 5Y, or neutral; value - 3 to 5 (2 or 3 moist); and chroma - 0 or 1
Texture - silty clay but is clay or silty clay loam in some pedons

Bss, Bssy, or Bkyg horizon:

Hue - 10YR, 2.5Y, 5Y, or neutral; value - 4 to 6 (2 to 4 moist); and chroma - 0 to 2
Texture - clay, silty clay, or silty clay loam

Cg horizon:

Hue - 2.5Y, 5Y, or neutral; value - 3 to 7 (2 to 5 moist); and chroma - 0 to 2
Texture - clay or silty clay

Maddock Series

Depth to restrictive feature: None

Drainage class: Well drained

Permeability: Rapid

Landform: Outwash plains

Parent material: Sandy glaciofluvial sediments

Slope: 6 to 9 percent

Typical Pedon

Maddock sandy loam, in an area of Maddock-Egeland sandy loams, 6 to 9 percent slopes, 450 feet south and 1,700 feet west of the northeast corner of sec. 23, T. 118 N., R. 61 W.; USGS Conde SW, SD topographic quadrangle; lat. 45 degrees 1 minute 20 seconds N. and long. 98 degrees 7 minutes 54 seconds W.

A—0 to 9 inches; dark gray (10YR 4/1) sandy loam, black (10YR 2/1) moist; weak fine granular structure; soft, very friable; many very fine and fine roots throughout; few very fine tubular pores; neutral; clear smooth boundary.

Bk—9 to 22 inches; light yellowish brown (2.5Y 6/3) loamy sand, olive brown (2.5Y 4/3) moist; single grain; loose; few very fine roots throughout; 15 percent calcium carbonate equivalent; common fine soft masses of carbonate; strongly effervescent; moderately alkaline; gradual smooth boundary.

C1—22 to 41 inches; light yellowish brown (2.5Y 6/3) sand, olive brown (2.5Y 4/3) moist; single grain; loose; few very fine roots throughout; 11 percent calcium carbonate equivalent; few carbonate coats between sand grains; 2 percent gravel; strongly effervescent; moderately alkaline; gradual smooth boundary.

C2—41 to 80 inches; light brownish gray (2.5Y 6/2) sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose; 12 percent calcium carbonate equivalent; few carbonate coats between sand grains; 2 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches

Depth to carbonates: 0 to 60 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 1 or 2 (in lower part)

Texture - sandy loam but is fine sandy loam in some pedons

Bk horizon:

Hue - 10YR or 2.5Y; value - 4 to 6 (2 to 5 moist); and chroma - 2 to 4

Texture - fine sand, loamy fine sand, or loamy sand

C horizon:

Hue - 2.5Y or 10YR; value - 4 to 7 (3 to 6 moist); and chroma - 2 to 4

Texture - fine sand, loamy fine sand, loamy sand, or sand but is ranges from sand to clay loam below 40 inches in some pedons

Max Series

Depth to restrictive feature: None

Drainage class: Well drained

Permeability: Moderately slow

Landform: Till plains and moraines

Parent material: Loamy glacial till

Slope: 0 to 15 percent

Typical Pedon

Max loam, in an area of Max-Arnegard-Zahl loams, 1 to 6 percent slopes, 120 feet west and 1,640 feet south of the northeast corner of sec. 19, T. 118 N., R. 65 W.; USGS Northville SW, SD topographic quadrangle; lat. 45 degrees 1 minute 22 seconds N. and long. 98 degrees 41 minutes 51 seconds W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak fine granular structure; soft, friable; common very fine roots throughout; few very fine tubular pores; neutral; abrupt smooth boundary.

Bw—8 to 14 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; weak coarse prismatic structure parting to weak medium subangular blocky; slightly hard, friable; common very fine roots throughout; few very fine tubular pores; slightly alkaline; clear smooth boundary.

Bk1—14 to 30 inches; light yellowish brown (2.5Y 6/3) loam, olive brown (2.5Y 4/3) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; slightly hard, friable; few very fine roots throughout; common very fine tubular pores; 14 percent calcium carbonate equivalent; common fine and medium soft masses of carbonate; 1 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bk2—30 to 40 inches; light yellowish brown (2.5Y 6/3) loam, olive brown (2.5Y 4/3) moist; weak medium and coarse prismatic structure parting to weak medium subangular blocky; slightly hard, friable; common very fine tubular pores; 18 percent calcium carbonate equivalent; common fine and medium soft masses of carbonate; 1 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.

C1—40 to 52 inches; light yellowish brown (2.5Y 6/4) loam, olive brown (2.5Y 4/4) moist; massive; hard, friable; few very fine tubular pores; 10 percent calcium carbonate equivalent; few fine soft masses of iron-manganese; few fine

prominent dark yellowish brown (10YR 4/6) relic redox features; 1 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
 C2—52 to 80 inches; light yellowish brown (2.5Y 6/4) loam, olive brown (2.5Y 4/4) moist; massive; hard, friable; few very fine tubular pores; 10 percent calcium carbonate equivalent; common fine soft masses of iron-manganese; few fine prominent dark yellowish brown (10YR 4/6) redox concentrations; 1 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches

Depth to carbonates: 10 to 25 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 2 or 3

Texture - loam but is clay loam in some pedons

Bw horizon:

Hue - 10YR or 2.5Y; value - 4 to 6 (3 or 4 moist); and chroma - 2 to 4

Texture - loam or clay loam

Bk horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - loam or clay loam

C horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (4 or 5 moist); and chroma - 2 to 4

Texture - loam or clay loam

Miranda Series

Depth to restrictive feature: Natric; top depth ranges from 0 to 5 inches

Drainage class: Moderately well and somewhat poorly drained

Permeability: Very slow

Landform: Till plains

Parent material: Loamy glacial till

Slope: 0 to 2 percent

Typical Pedon

Miranda loam, in an area of Noonan-Miranda loams 0 to 2 percent slopes, 2,350 feet east and 1,820 feet north of the southwest corner of sec. 31, T. 119 N., R. 65 W.; USGS Northville SW, SD topographic quadrangle; lat. 45 degrees 4 minutes 35 seconds N. and long. 98 degrees 42 minutes 26 seconds W.

E—0 to 3 inches; gray (10YR 5/1) loam, very dark gray (10YR 3/1) moist; weak thin platy structure; slightly hard, friable; many very fine roots throughout; common very fine tubular pores; slightly acid; abrupt smooth boundary.

Bt1—3 to 7 inches; dark gray (10YR 4/1) clay loam, very dark brown (10YR 2/2) moist; strong medium columnar structure; very hard, firm, sticky and plastic; common very fine roots between peds; few very fine tubular pores; gray (10YR 5/1) coats on tops of columns and clay films on vertical faces of peds; neutral; abrupt smooth boundary.

- Btn2**—7 to 13 inches; dark gray (10YR 4/1) clay loam, very dark brown (10YR 2/2) moist; moderate medium prismatic structure parting to moderate fine and medium angular blocky; very hard, firm, sticky and plastic; common very fine roots between peds; few very fine tubular pores; clay films on vertical faces of peds; neutral; clear smooth boundary.
- Btnz**—13 to 17 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; very hard, firm, sticky and plastic; few very fine roots between peds; few very fine tubular pores; clay films on vertical faces of peds; common fine salt masses and few fine nests of gypsum; moderately alkaline; clear smooth boundary.
- Bkz**—17 to 32 inches; light yellowish brown (2.5Y 6/3) clay loam, olive brown (2.5Y 4/3) moist; weak fine and medium subangular blocky structure; hard, firm, sticky and plastic; few very fine tubular pores; 12 percent calcium carbonate equivalent; common fine soft masses of carbonate and common fine salt masses and few fine nests of gypsum; few fine prominent dark yellowish brown (10YR 4/6) redox concentrations and few fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline; clear wavy boundary.
- C1**—32 to 63 inches; light gray (2.5Y 7/2) clay loam, grayish brown (2.5Y 5/2) moist; massive; hard, firm, sticky and plastic; few very fine tubular pores; 9 percent calcium carbonate equivalent; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; 2 percent pebbles; strongly effervescent; strongly alkaline; gradual wavy boundary.
- C2**—63 to 80 inches; light yellowish brown (2.5Y 6/3) clay loam, olive brown (2.5Y 4/3) moist; massive; hard, firm, sticky and plastic; few very fine tubular pores; 8 percent calcium carbonate equivalent; many fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations and many fine prominent gray (10YR 5/1) redox depletions; 2 percent pebbles; strongly effervescent; strongly alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 20 inches

Depth to carbonates: 5 to 25 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: 5 to 16 inches

Remarks: Some pedons have an A horizon.

A horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 1 or 2

Texture - loam

E horizon:

Hue - 10YR or 2.5Y; value - 4 to 7 (3 or 4 moist); and chroma - 1 or 2

Texture - loam but is silt loam in some pedons

Btn horizon:

Hue - 10YR or 2.5Y; value - 3 to 6 (2 to 4 moist); and chroma - 1 or 2

Texture - clay loam

Bk horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 3 to 7 (3 to 6 moist); and chroma - 2 to 4

Texture - clay loam or loam

C horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 4 to 8 (3 to 7 moist); and chroma - 1 to 4

Texture - clay loam or loam

Moritz Series

Depth to restrictive feature: None

Drainage class: Somewhat poorly drained

Permeability: Moderate

Landform: Flood plains

Parent material: Loamy alluvium

Slope: 0 to 2 percent

Typical Pedon

Moritz loam, in an area of Moritz-Lowe loams, 0 to 2 percent slopes, 120 feet west and 925 feet north of the southeast corner of sec. 7, T. 119 N., R. 60 W.; USGS Conde, SD topographic quadrangle; lat. 45 degrees 7 minutes 40 seconds N. and long. 98 degrees 5 minutes 4 seconds W.

- Ap—0 to 7 inches; very dark gray (10YR 3/1) loam, black (10YR 2/1) moist; weak fine granular structure; slightly hard, friable; few very fine roots throughout; few very fine tubular pores; 7 percent calcium carbonate equivalent; slightly effervescent; slightly alkaline; abrupt smooth boundary.
- A—7 to 12 inches; dark gray (10YR 4/1) loam, very dark gray (10YR 3/1) moist; weak medium subangular blocky structure; slightly hard, friable; few very fine roots throughout; common very fine tubular pores; 9 percent calcium carbonate equivalent; strongly effervescent; slightly alkaline; clear wavy boundary.
- Bk1—12 to 20 inches; light brownish gray (2.5Y 6/2) loam, light olive brown (2.5Y 5/3) moist; weak medium subangular blocky structure; slightly hard, friable; few very fine roots throughout; many very fine and fine tubular pores; 29 percent calcium carbonate equivalent; violently effervescent; strongly alkaline; gradual wavy boundary.
- Bk2—20 to 34 inches; light olive brown (2.5Y 5/3) loam, olive brown (2.5Y 4/3) moist; weak medium subangular blocky structure; slightly hard, friable; common very fine tubular pores; 18 percent calcium carbonate equivalent; violently effervescent; strongly alkaline; clear wavy boundary.
- Bk3—34 to 44 inches; grayish brown (2.5Y 5/2) loam, dark grayish brown (2.5Y 4/2) moist; weak medium subangular blocky structure; slightly hard, friable; common very fine tubular pores; 17 percent calcium carbonate equivalent; few fine distinct brown (10YR 4/3) redox concentrations; violently effervescent; strongly alkaline; clear wavy boundary.
- C1—44 to 54 inches; grayish brown (2.5Y 5/2) loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard, friable; few very fine tubular pores; 9 percent calcium carbonate equivalent; few fine distinct brown (10YR 4/3) redox concentrations; strongly effervescent; strongly alkaline; clear wavy boundary.
- C2—54 to 80 inches; light olive brown (2.5Y 5/3) stratified loam and loamy sand, olive brown (2.5Y 4/3) moist; massive; slightly hard, friable; few very fine tubular pores; 8 percent calcium carbonate equivalent; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations; strongly effervescent; strongly alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 24 inches

Depth to carbonates: 0 to 6 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR or neutral; value - 3 or 4 (2 or 3 moist); and chroma - 0 or 1
 Texture - loam but is clay loam or silt loam in some pedons

Bk horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 4 to 7 (3 to 6 moist); and chroma - 1 to 3
 Texture - loam, clay loam, or silt loam

C horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (4 or 5 moist); and chroma - 2 to 4
 Texture - stratified loam and loamy sand but is stratified silt loam, sandy loam, clay loam, or silty clay loam in some pedons

Nahon Series

Depth to restrictive feature: Natric; top depth ranges from 6 to 17 inches

Drainage class: Moderately well drained

Permeability: Very slow

Landform: Lake plains

Parent material: Clayey glaciolacustrine sediments over loamy glacial till

Slope: 0 to 2 percent

Typical Pedon

Nahon silt loam (fig. 26), in an area of Exline-Aberdeen-Nahon silt loams, 0 to 2 percent slopes, 550 feet north and 1,850 feet east of the southwest corner of sec. 13, T. 120 N., R. 65 W.; USGS Northville, SD topographic quadrangle; lat. 45 degrees 12 minutes 16 seconds N. and long. 98 degrees 36 minutes 34 seconds W.

Ap—0 to 7 inches; dark gray (10YR 4/1) silt loam, very dark gray (10YR 3/1) moist; weak fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots throughout; common very fine tubular pores; neutral; abrupt smooth boundary.

E—7 to 9 inches; gray (10YR 5/1) silt loam, very dark gray (10YR 3/1) moist; weak thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots throughout; common very fine tubular pores; neutral; abrupt smooth boundary.

B_{tn}1—9 to 16 inches; dark grayish brown (10YR 4/2) silty clay, very dark grayish brown (10YR 3/2) moist; moderate medium columnar structure parting to moderate fine and medium angular blocky; very hard, very firm, sticky and plastic; few very fine roots between peds; few very fine tubular pores; gray (10YR 5/1) coats on tops of columns and clay films on vertical faces of peds; moderately alkaline; clear wavy boundary.

B_{tn}2—16 to 24 inches; dark grayish brown (10YR 4/2) silty clay, very dark grayish brown (10YR 3/2) moist; moderate fine and medium prismatic structure parting to moderate fine and medium angular blocky; very hard, very firm, sticky and plastic; few very fine roots between peds; few very fine tubular pores; clay films on vertical faces of peds; moderately alkaline; clear wavy boundary.

B_{kz}—24 to 36 inches; light yellowish brown (2.5Y 6/3) silty clay loam, light olive brown (2.5Y 5/3) moist; weak fine and medium prismatic structure parting to weak fine subangular blocky; hard, firm, slightly sticky and slightly plastic; few very fine tubular pores; 15 percent calcium carbonate equivalent; common fine salt masses and few fine gypsum crystals; strongly effervescent; moderately alkaline; clear wavy boundary.

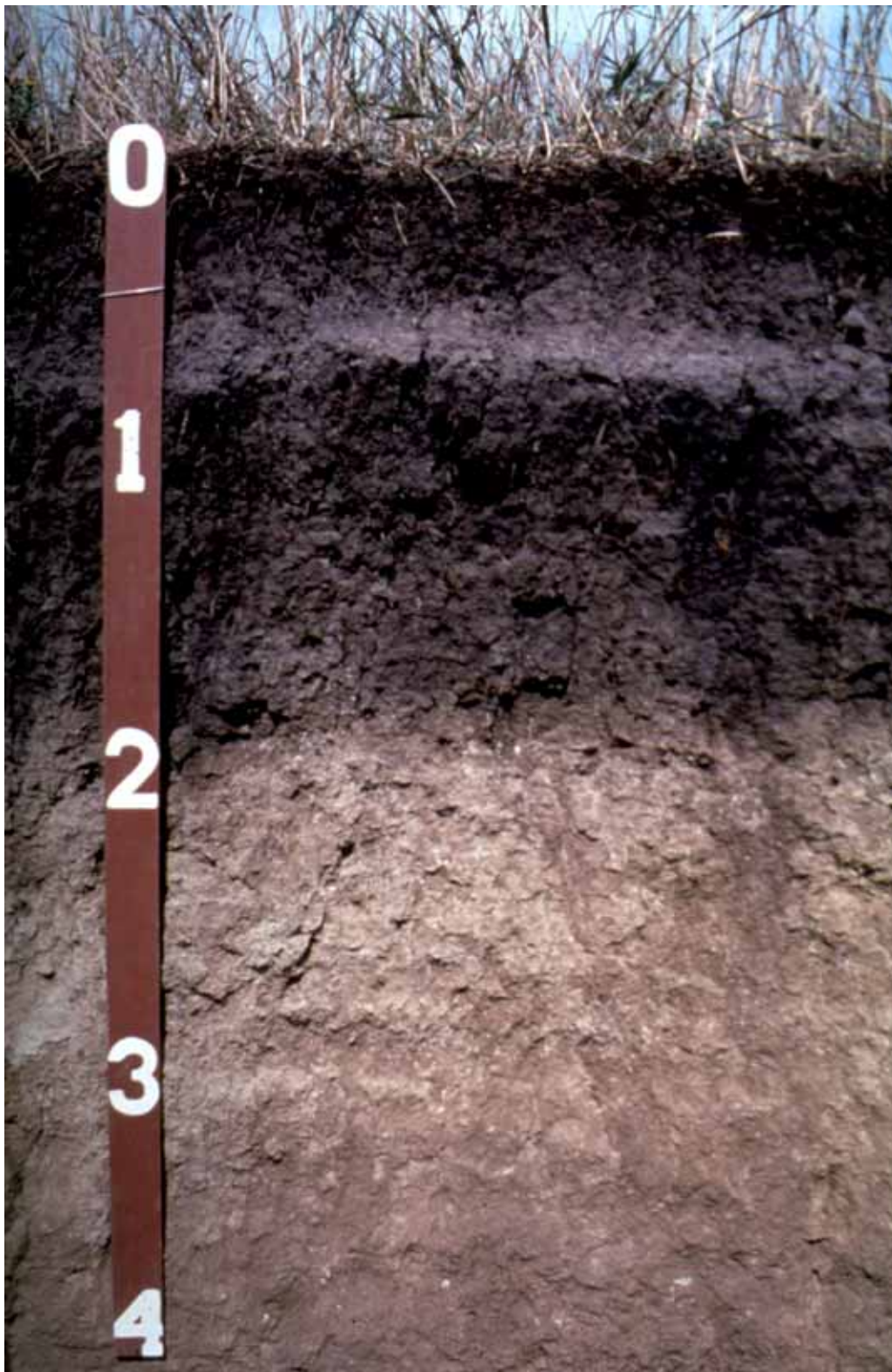


Figure 26. Profile of Nahon silt loam. This soil has a claypan starting at about 9 inches. Depth is marked in feet.

- C1—36 to 46 inches; light gray (2.5Y 7/2) silty clay loam, light brownish gray (2.5Y 6/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; varved with very fine sand to clay; 10 percent calcium carbonate equivalent; common fine and medium distinct gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C2—46 to 80 inches; pale yellow (2.5Y 8/3) silty clay loam, light yellowish brown (2.5Y 6/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; varved with very fine sand to clay; 10 percent calcium carbonate equivalent; common fine and medium distinct gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 to 30 inches

Depth to carbonates: 14 to 32 inches

Depth to contrasting parent material: Greater than 40 inches over glacial till

Depth to gypsum and other visible salts other than carbonates: 16 to 35 inches

Remarks: Some pedons have a loam or clay loam 2C horizon.

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1

Texture - silt loam or silty clay loam

E horizon:

Hue - 10YR; value - 5 or 6 (3 or 4 moist); and chroma - 1 or 2

Texture - silt loam or silty clay loam

Btn horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 or 3 moist); and chroma - 1 to 3

Texture - silty clay or silty clay loam

Bz or Bkz horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 4 to 8 (3 to 6 moist); and chroma - 1 to 4

Texture - silty clay loam or silty clay

C horizon:

Hue - 10YR or 2.5Y; value - 5 to 8 (4 to 7 moist); and chroma - 2 to 4

Texture - silty clay loam or silty clay and typically is varved with very fine sand to clay in the lower part

2C horizon:

Hue - 10YR or 2.5Y; value - 5 to 8 (4 to 7 moist); and chroma - 2 to 4

Texture - clay loam or loam

Niobell Series

Depth to restrictive feature: None

Drainage class: Moderately well drained

Permeability: Slow

Landform: Till plains

Parent material: Loamy glacial till

Slope: 0 to 6 percent

Typical Pedon

Niobell loam, in an area of Niobell-Noonan loams, 0 to 2 percent slopes, 1,100 feet west and 2,350 feet north of the southeast corner of sec. 5, T. 118 N., R. 65 W.; USGS Northville SW, SD topographic quadrangle; lat. 45 degrees 3 minutes 46 seconds N. and long. 98 degrees 40 minutes 48 seconds W.

- A—0 to 7 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak fine granular structure; slightly hard, friable; many very fine roots throughout and few fine throughout; common very fine tubular pores; slightly acid; abrupt smooth boundary.
- BE—7 to 12 inches; grayish brown (10YR 5/2) and light brownish gray (10YR 6/2) loam, very dark grayish brown (10YR 3/2) and dark grayish brown (10YR 4/2) moist; weak fine and medium subangular blocky structure parting to weak thin platy; slightly hard, friable; common very fine roots throughout; common very fine tubular pores; neutral; clear wavy boundary.
- Btn1—12 to 16 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate fine and medium angular blocky; very hard, firm, sticky and plastic; common very fine roots between peds; few very fine tubular pores; clay films on vertical faces of peds; neutral; clear wavy boundary.
- Btn2—16 to 28 inches; brown (10YR 5/3) clay loam, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; very hard, firm, sticky and plastic; common very fine roots between peds; few very fine tubular pores; clay films on vertical faces of peds; slightly alkaline; clear wavy boundary.
- Bky—28 to 42 inches; light gray (2.5Y 7/2) clay loam, grayish brown (2.5Y 5/2) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine tubular pores; 18 percent calcium carbonate equivalent; common fine soft masses of carbonate and common fine gypsum crystals and few fine salt masses; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C1—42 to 58 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, friable, slightly sticky and slightly plastic; common very fine tubular pores; 11 percent calcium carbonate equivalent; common fine prominent dark yellowish brown (10YR 4/4) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; 2 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C2—58 to 80 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, friable, slightly sticky and slightly plastic; common very fine tubular pores; 10 percent calcium carbonate equivalent; very few manganese or iron-manganese stains throughout; common fine prominent dark yellowish brown (10YR 4/4) redox concentrations and many fine and medium prominent gray (10YR 5/1) redox depletions; 2 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 37 inches

Depth to carbonates: 10 to 37 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: 16 to 37 inches

Remarks: Some pedons have a B/E or BCKy horizon.

A horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 2 or 3

Texture - loam but is silt loam or clay loam in some pedons

B/E or BE horizon:

Hue - 10YR or 2.5Y; value - 4 to 7 (3 to 5 moist); and chroma - 1 to 3

Texture - loam but is silt loam or very fine sandy loam in some pedons

Btn horizon:

Hue - 10YR or 2.5Y; value - 3 to 6 (2 to 4 moist); and chroma - 2 to 4
Texture - clay loam

Bky horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4
Texture - clay loam or loam

C horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4
Texture - clay loam or loam

Noonan Series

Depth to restrictive feature: Natric; top depth ranges from 5 to 10 inches

Drainage class: Moderately well drained

Permeability: Very slow

Landform: Till plains

Parent material: Loamy glacial till

Slope: 0 to 6 percent

Typical Pedon

Noonan loam, in an area of Niobell-Noonan loams 0 to 2 percent slopes, 1,100 feet west and 1,050 feet south of the northeast corner of sec. 32, T. 119 N., R. 65 W.; USGS Northville SW, SD topographic quadrangle; lat. 45 degrees 5 minutes 3 seconds N. and long. 98 degrees 40 minutes 48 seconds W.

A—0 to 6 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak fine granular structure; slightly hard, friable; many very fine roots throughout; few very fine tubular pores; neutral; clear smooth boundary.

E—6 to 8 inches; light brownish gray (10YR 6/2) loam, dark grayish brown (10YR 4/2) moist; weak thin platy structure; slightly hard, friable; common very fine roots throughout; common very fine tubular pores; neutral; abrupt smooth boundary.

Btn1—8 to 12 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; strong medium columnar structure; very hard, firm, sticky and plastic; common very fine roots between peds; few very fine tubular pores; light brownish gray (10YR 6/2) coats on tops of columns and clay films on vertical faces of peds; slightly alkaline; clear smooth boundary.

Btn2—12 to 18 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; very hard, firm, sticky and plastic; common very fine roots between peds; few very fine tubular pores; clay films on vertical faces of peds; slightly alkaline; clear smooth boundary.

Bky—18 to 31 inches; light yellowish brown (2.5Y 6/3) clay loam, olive brown (2.5Y 4/3) moist; weak fine and medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few very fine roots throughout; common very fine tubular pores; 14 percent calcium carbonate equivalent; common fine soft masses of carbonate and common fine nests of gypsum and few fine salt masses; strongly effervescent; moderately alkaline; clear wavy boundary.

C1—31 to 54 inches; light yellowish brown (2.5Y 6/3) clay loam, olive brown (2.5Y 4/3) moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine tubular pores; 11 percent calcium carbonate equivalent; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; 2 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.

C2—54 to 80 inches; light yellowish brown (2.5Y 6/4) clay loam, olive brown (2.5Y 4/4) moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine tubular pores; 10 percent calcium carbonate equivalent; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine and medium prominent gray (10YR 5/1) redox depletions; 2 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 22 inches

Depth to carbonates: 8 to 30 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: 16 to 40 inches

Remarks: Some pedons have a BCy horizon.

A horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 2 or 3

Texture - loam but is silt loam or clay loam in some pedons

E horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (3 to 5 moist); and chroma - 1 or 2

Texture - loam or silt loam

Btn horizon:

Hue - 10YR or 2.5Y; value - 3 to 6 (2 to 4 moist); and chroma - 2 to 4

Texture - clay loam

Bky horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - clay loam or loam

C horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - clay loam or loam

Northville Series

Depth to restrictive feature: None

Drainage class: Moderately well drained

Permeability: Slow

Landform: Flood plains

Parent material: Clayey alluvium

Slope: 0 to 2 percent

Typical Pedon

Northville silt loam, in an area of Northville-Farmsworth silt loams, 0 to 2 percent slopes, 275 feet east and 2,550 north of the southwest corner of sec. 23, T. 114 N., R. 61 W.; lat. 44 degrees 40 minutes 5 seconds N and long. 98 degrees 7 minutes 30 seconds W.

Ap—0 to 5 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; weak fine and medium subangular blocky structure parting to weak fine granular; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; common very fine tubular pores; slightly acid; abrupt smooth boundary.

BE—5 to 8 inches; gray (10YR 5/1) silty clay loam, very dark gray (10YR 3/1) moist; weak fine and medium subangular blocky structure parting to weak thin platy; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots

throughout; common very fine tubular pores; gray (10YR 6/1) dry, coats on faces of peds and in pores; slightly acid; clear smooth boundary.

Btn1— 8 to 13 inches; dark gray (10YR 4/1) silty clay, black (10YR 2/1) moist; moderate medium prismatic structure parting to moderate medium angular blocky; very hard, firm, sticky and plastic; common very fine roots between peds; common very fine tubular pores; clay films on vertical faces of peds; neutral; gradual wavy boundary.

Btn2—13 to 22 inches; dark gray (10YR 4/1) silty clay, black (10YR 2/1) moist; moderate fine and medium prismatic structure parting to moderate fine angular blocky; very hard, firm, sticky and plastic; common very fine roots between peds; common very fine tubular pores; clay films on vertical faces of peds; moderately alkaline; gradual wavy boundary.

Bk1—22 to 42 inches; light brownish gray (10YR 6/2) silty clay loam, dark grayish brown (10YR 4/2) moist; weak medium prismatic structure parting to weak fine subangular blocky; hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; common very fine tubular pores; 11 percent calcium carbonate equivalent; common fine soft masses of carbonate; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bk2—42 to 58 inches; grayish brown (10YR 5/2) silty clay, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to weak fine subangular blocky; hard, friable, slightly sticky and slightly plastic; common very fine tubular pores; 10 percent calcium carbonate equivalent; common fine soft masses of carbonate; strongly effervescent; moderately alkaline; gradual wavy boundary.

Ab—58 to 69 inches; dark gray (N 4/0) silty clay, black (N 2/0) moist; weak fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine tubular pores; 4 percent calcium carbonate equivalent; few fine soft masses of carbonate; slightly effervescent; moderately alkaline; gradual wavy boundary.

C—69 to 80 inches; light gray (2.5Y 7/2) clay loam, grayish brown (2.5Y 5/2) moist; massive; hard, friable, slightly sticky and slightly plastic; many very fine tubular pores; 8 percent calcium carbonate equivalent; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: Greater than 20 inches

Depth to carbonates: 20 to 50 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 40 inches

A horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 1 or 2

Texture - silt loam but is silty clay loam or loam in some pedons

BE horizon:

Hue - 10YR; value - 5 or 6 (3 or 4 moist); and chroma - 1 or 2

Texture - silt loam or silty clay loam but is loam in some pedons

Btn horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 to 4 moist); and chroma - 1 or 2

Texture - silty clay or silty clay loam

Bk horizon:

Hue - 10YR or 2.5Y; value - 3 to 7 (2 to 5 moist); and chroma - 1 to 3

Texture - silt loam, silty clay loam, silty clay, or clay loam

C horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4
Texture - silt loam, silty clay loam, loam, or clay loam

Overshue Series

Depth to restrictive feature: None

Drainage class: Poorly drained

Permeability: Moderately rapid in the loamy sediments and moderately slow in the underlying glacial till

Landform: Till plains

Parent material: Loamy glaciofluvial sediment over loamy glacial till

Slope: 0 to 1 percent

Typical Pedon

Overshue fine sandy loam (fig. 27), in an area of Hand-Carthage-Overshue fine sandy loams, 0 to 3 percent slopes, 1,450 feet east and 480 feet south of the northwest corner of sec. 25, T. 114 N., R. 64 W.; USGS Hitchcock, SD topographic quadrangle; lat. 44 degrees 39 minutes 42 seconds N. and long. 98 degrees 28 minutes 42 seconds W.

- A1—0 to 2 inches; dark gray (10YR 4/1) fine sandy loam, black (10YR 2/1) moist; weak fine granular structure; soft, very friable; many very fine and fine roots throughout; few very fine tubular pores; few fine prominent strong brown (7.5YR 5/6) redox concentrations; neutral; abrupt smooth boundary.
- A2—2 to 7 inches; dark gray (10YR 4/1) fine sandy loam, black (10YR 2/1) moist; weak medium subangular blocky structure parting to weak fine granular; soft, very friable; common very fine and fine roots throughout; few very fine tubular pores; few fine prominent brown (7.5YR 4/4) redox concentrations; neutral; clear wavy boundary.
- Bw1—7 to 22 inches; grayish brown (10YR 5/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; soft, very friable; common very fine and fine roots throughout; few very fine tubular pores; few fine and medium soft masses of iron-manganese; common fine prominent brown (7.5YR 4/4) redox concentrations; neutral; clear wavy boundary.
- Bw2—22 to 32 inches; light olive brown (2.5Y 5/3) fine sandy loam, olive brown (2.5Y 4/3) moist; moderate medium prismatic structure parting to weak medium subangular blocky; soft, very friable; few very fine and fine roots throughout; few very fine tubular pores; common fine and medium soft masses of iron-manganese; common fine prominent brown (7.5YR 4/4) redox concentrations; neutral; gradual wavy boundary.
- Bw3—32 to 42 inches; light yellowish brown (2.5Y 6/4) sandy loam, light olive brown (2.5Y 5/4) moist; weak medium prismatic structure parting to weak medium subangular blocky; soft, very friable; few very fine roots throughout; few very fine tubular pores; many fine and medium soft masses of iron-manganese; common fine prominent strong brown (7.5YR 4/6) redox concentrations and few fine prominent light brownish gray (10YR 6/2) redox depletions; neutral; clear smooth boundary.
- 2Bkg—42 to 57 inches; light gray (2.5Y 7/2) clay loam, grayish brown (2.5Y 5/2) moist; weak medium prismatic structure parting to weak medium subangular blocky; very hard, firm, slightly sticky and slightly plastic; few very fine roots throughout; few very fine tubular pores; 17 percent calcium carbonate



Figure 27. Profile of Overshue fine sandy loam. There is about 43 inches of fine sandy loam material over the clay loam glacial till. Depth is marked in feet.

equivalent; common fine and medium soft masses of carbonate and common fine soft masses of iron-manganese; common fine prominent yellowish brown (10YR 5/6) redox concentrations and few fine distinct gray (2.5Y 6/1) redox depletions; 2 percent pebbles; strongly effervescent; moderately alkaline; clear smooth boundary.

2Cg—57 to 80 inches; light yellowish brown (2.5Y 6/3) clay loam, olive brown (2.5Y 4/3) moist; massive; very hard, firm, slightly sticky and slightly plastic; few very fine tubular pores; 11 percent calcium carbonate equivalent; few fine and medium soft masses of iron-manganese; many fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations and many fine and medium prominent gray (10YR 6/1) redox depletions; 4 percent pebbles; slightly effervescent; slightly alkaline.

Range in Characteristics

Mollic epipedon thickness: 10 to 30 inches

Depth to carbonates: 40 to 60 inches

Depth to contrasting parent material: Greater than 40 inches over glacial till

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 1 or 2

Texture - fine sandy loam but is very fine sandy loam, sandy loam, or loam in some pedons

Bw horizon:

Hue - 10YR or 2.5Y; value - 4 to 6 (2 to 5 moist); and chroma - 1 to 4

Texture - fine sandy loam, very fine sandy loam, or sandy loam but is loamy sand or loamy fine sand in some pedons

2Bkg or 2C horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (4 or 5 moist); and chroma - 2 to 4

Texture - clay loam or loam

Parnell Series

Depth to restrictive feature: None

Drainage class: Very poorly drained

Permeability: Slow

Landform: Till plains

Parent material: Local clayey alluvium

Slope: 0 to 1 percent

Typical Pedon

Parnell silty clay loam, 0 to 1 percent slopes, 1,100 feet south and 1,150 feet west of the northeast corner of sec. 20, T. 115 N., R. 60 W.; USGS Doland SE, SD topographic quadrangle; lat. 44 degrees 45 minutes 34 seconds N. and long. 98 degrees 6 minutes 6 seconds W.

A1—0 to 7 inches; dark gray (10YR 4/1) silty clay loam, black (10YR 2/1) moist; weak fine subangular blocky structure parting to weak fine and medium granular; hard, friable, slightly sticky and slightly plastic; many very fine and fine roots throughout; common very fine tubular pores; common organic coats throughout; slightly alkaline; clear smooth boundary.

- A2—7 to 11 inches; gray (10YR 5/1) silty clay loam, very dark gray (10YR 3/1) moist; weak fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; common very fine tubular pores; common fine iron-manganese concretions; slightly alkaline; clear smooth boundary.
- Btg1—11 to 16 inches; gray (5Y 5/1) silty clay, very dark gray (5Y 3/1) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; very hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine tubular pores; clay films on vertical faces of peds; common fine iron-manganese concretions; slightly alkaline; gradual wavy boundary.
- Btg2—16 to 28 inches; dark gray (5Y 4/1) silty clay, black (5Y 2.5/1) moist; moderate fine and medium prismatic structure; very hard, firm, sticky and plastic; few very fine roots throughout; few very fine tubular pores; clay films on vertical faces of peds; slightly alkaline; gradual wavy boundary.
- Btg3—28 to 41 inches; gray (5Y 6/1) silty clay, dark gray (5Y 4/1) moist; moderate fine and medium prismatic structure; very hard, firm, sticky and plastic; few very fine tubular pores; clay films on vertical faces of peds; common fine and medium distinct gray (2.5Y 5/1) redox depletions; slightly alkaline; gradual wavy boundary.
- Bkg—41 to 69 inches; light gray (5Y 7/2) silty clay loam, olive gray (5Y 5/2) moist; weak fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; many very fine tubular pores; 15 percent calcium carbonate equivalent; common fine soft masses of carbonate; many fine prominent dark yellowish brown (10YR 4/6) redox concentrations; strongly effervescent; slightly alkaline; gradual wavy boundary.
- Cg—69 to 80 inches; pale yellow (5Y 7/3) clay loam, olive (5Y 5/3) moist; massive; hard, friable, slightly sticky and slightly plastic; common very fine tubular pores; 13 percent calcium carbonate equivalent; common fine soft masses of carbonate and few fine soft masses of iron-manganese; common fine prominent light olive brown (2.5Y 5/6) redox concentrations and common fine prominent gray (2.5Y 5/1) redox depletions; 1 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: Greater than 24 inches

Depth to carbonates: Greater than 35 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR, 2.5Y, 5Y, or neutral; value - 3 to 5 (2 or 3 moist); and chroma - 0 or 1
Texture - silty clay loam but is silt loam or silty clay in some pedons

Btg horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 3 to 6 (2 to 4 moist); and chroma - 1 or 2
Texture - silty clay or silty clay loam but is clay loam or clay in some pedons

Bkg horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 4 to 7 (3 to 6 moist); and chroma - 1 to 4

Cg horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 4 to 7 (3 to 6 moist); and chroma - 1 to 4
Texture - loam, clay loam or silty clay loam but is silty clay or clay in some pedons

Parshall Series

Depth to restrictive feature: None

Drainage class: Well drained

Permeability: Moderately rapid

Landform: Outwash plains

Parent material: Loamy glaciofluvial sediments

Slope: 0 to 3 percent

Typical Pedon

Parshall loam, 0 to 3 percent slopes, 2,530 feet south and 120 feet west of the northeast corner of sec. 30, T. 117 N., R. 65 W.; USGS Zell, SD topographic quadrangle; lat. 44 degrees 55 minutes 8 seconds N. and long. 98 degrees 41 minutes 46 seconds W.

- Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) loam, very dark brown (10YR 2/2) moist; weak fine and medium subangular blocky structure parting to moderate fine and medium granular; slightly hard, friable; few very fine roots throughout; few very fine tubular pores; neutral; abrupt smooth boundary.
- A—7 to 11 inches; very dark grayish brown (10YR 3/2) loam, very dark brown (10YR 2/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable; few very fine roots throughout; few very fine tubular pores; neutral; clear smooth boundary.
- Bw1—11 to 26 inches; dark grayish brown (10YR 4/2) sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium and coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable; few very fine roots throughout; common very fine tubular pores; neutral; clear wavy boundary.
- Bw2—26 to 36 inches; dark grayish brown (10YR 4/2) sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable; few very fine roots throughout; common very fine tubular pores; neutral; clear wavy boundary.
- Bk1—36 to 50 inches; light yellowish brown (2.5Y 6/3) loamy sand, olive brown (2.5Y 4/3) moist; weak fine subangular blocky structure; soft, very friable; few very fine roots throughout; few very fine tubular pores; 9 percent calcium carbonate equivalent; strongly effervescent; moderately alkaline; gradual wavy boundary.
- Bk2—50 to 59 inches; light yellowish brown (2.5Y 6/3) sandy loam, olive brown (2.5Y 4/3) moist; weak fine and medium subangular blocky structure; soft, very friable; few very fine tubular pores; 11 percent calcium carbonate equivalent; common fine distinct dark yellowish brown (10YR 4/4) relict redox features; strongly effervescent; moderately alkaline; gradual wavy boundary.
- Bck—59 to 67 inches; light brownish gray (2.5Y 6/2) sandy loam, grayish brown (2.5Y 5/2) moist; weak fine and medium subangular blocky structure; soft, very friable; few very fine tubular pores; 9 percent calcium carbonate equivalent; few fine and medium soft masses of iron-manganese; common fine distinct dark yellowish brown (10YR 4/4) relict redox features; strongly effervescent; moderately alkaline; clear wavy boundary.
- C—67 to 80 inches; light yellowish brown (2.5Y 6/3) loamy sand, light olive brown (2.5Y 5/3) moist; single grain; loose; 7 percent calcium carbonate equivalent; common fine and medium distinct dark yellowish brown (10YR 4/4) redox concentrations; slightly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 to 45 inches

Depth to carbonates: 20 to 60 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR; value - 2 to 5 (2 or 3 moist); and chroma - 2 or 3

Texture - loam but is sandy loam or fine sandy loam in some pedons

Bw horizon:

Hue - 10YR or 2.5Y; value - 3 to 6 (2 to 5 moist); and chroma - 2 to 4

Texture - sandy loam, fine sandy loam, or loam but is loamy fine sand in some pedons

Bk or BCK horizon:

Hue - 10YR or 2.5Y; value - 5 or 6 (4 or 5 moist); and chroma - 2 to 4

Texture - fine sandy loam, sandy loam, loamy fine sand, or loamy sand

C horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 4 to 7 (3 to 6 moist); and chroma - 2 to 6

Texture - fine sandy loam, sandy loam, loamy fine sand, loamy sand, or very fine sandy loam

Peever Series

Depth to restrictive feature: None

Drainage class: Well drained

Permeability: Slow

Landform: Till plains

Parent material: Clayey glacial till

Slope: 0 to 4 percent

Typical Pedon

Peever clay loam, 0 to 2 percent slopes, 2,550 feet north and 1,700 feet east of the southwest corner of sec. 4, T. 120 N., R. 60 W.; USGS Conde, SD topographic quadrangle; lat. 45 degrees 14 minutes 0 seconds N. and long. 98 degrees 3 minutes 23 seconds W.

Ap—0 to 7 inches; dark gray (10YR 4/1) clay loam, black (10YR 2/1) moist; moderate fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots throughout; few very fine tubular pores; neutral; abrupt smooth boundary.

Bt—7 to 15 inches; dark grayish brown (10YR 4/2) clay loam, very dark brown (10YR 2/2) moist; moderate medium prismatic structure parting to moderate medium angular blocky; very hard, firm, sticky and plastic; few very fine roots throughout; few very fine tubular pores; clay films on vertical faces of peds; slightly alkaline; clear smooth boundary.

Bk1—15 to 29 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm, sticky and plastic; few very fine roots throughout; few very fine tubular pores; 16 percent calcium carbonate equivalent; many medium and coarse soft masses of carbonate; strongly effervescent; moderately alkaline; gradual smooth boundary.

- Bk2**—29 to 38 inches; light yellowish brown (2.5Y 6/3) clay loam, olive brown (2.5Y 4/3) moist; weak medium prismatic structure parting to weak medium subangular blocky; hard, firm, slightly sticky and slightly plastic; few very fine tubular pores; 15 percent calcium carbonate equivalent; very few iron stains; common fine and medium soft masses of carbonate and few fine soft masses of iron-manganese; strongly effervescent; moderately alkaline; gradual smooth boundary.
- C1**—38 to 56 inches; light yellowish brown (2.5Y 6/3) clay loam, olive brown (2.5Y 4/3) moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine tubular pores; 13 percent calcium carbonate equivalent; very few iron stains; few fine soft masses of iron-manganese; few fine prominent dark yellowish brown (10YR 4/6) and few fine prominent gray (10YR 5/1) relict redox features; 2 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C2**—56 to 80 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, firm, sticky and plastic; few very fine tubular pores; 2 percent shale chips; 11 percent calcium carbonate equivalent; very few iron stains; few fine soft masses of iron-manganese; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations and few fine prominent gray (10YR 5/1) redox depletions; 2 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches

Depth to carbonates: 13 to 26 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 55 inches

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1

Texture - clay loam but is loam or silty clay loam in some pedons

Bt horizon:

Hue - 10YR or 2.5Y; value - 4 to 6 (2 to 4 moist); and chroma - 1 to 3

Texture - clay, silty clay, or clay loam

Bk horizon:

Hue - 2.5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - clay or clay loam

C horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - clay or clay loam

Playmoor Series

Depth to restrictive feature: None

Drainage class: Poorly drained

Permeability: Moderately slow

Landform: Flood plains

Parent material: Silty alluvium

Slope: 0 to 2 percent

Typical Pedon

Playmoor silty clay loam, 0 to 1 percent slopes, 620 feet south and 2,600 feet west of the northeast corner of sec. 12, T. 120 N., R. 60 W.; USGS Crandall, SD topographic

quadrangle; lat. 45 degrees 13 minutes 28 seconds N. and long. 97 degrees 59 minutes 29 seconds W.

- Az—0 to 9 inches; dark gray (10YR 4/1) silty clay loam, black (10YR 2/1) moist; weak fine subangular blocky structure parting to weak fine granular; hard, firm, slightly sticky and slightly plastic; many very fine roots throughout; few very fine tubular pores; 8 percent calcium carbonate equivalent; common fine salt masses; strongly effervescent; moderately alkaline; clear smooth boundary.
- Bz1—9 to 17 inches; gray (5Y 5/1) silty clay loam, very dark gray (5Y 3/1) moist; weak medium and coarse subangular blocky structure; very hard, firm, slightly sticky and slightly plastic; common very fine roots throughout; common very fine tubular pores; 18 percent calcium carbonate equivalent; few fine soft masses of carbonate and many fine salt masses; strongly effervescent; strongly alkaline; clear smooth boundary.
- Bz2—17 to 27 inches; dark gray (5Y 4/1) silty clay loam, black (5Y 2/1) moist; weak medium subangular blocky structure; very hard, firm, slightly sticky and slightly plastic; few very fine roots throughout; few very fine tubular pores; 16 percent calcium carbonate equivalent; few fine soft masses of carbonate and common fine salt masses; strongly effervescent; strongly alkaline; clear wavy boundary.
- Cyg1—27 to 46 inches; light olive gray (5Y 6/2) silty clay loam, olive gray (5Y 4/2) moist; massive; very hard, firm, slightly sticky and slightly plastic; few very fine tubular pores; 15 percent calcium carbonate equivalent; common fine nests of gypsum; few fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; strongly alkaline; gradual wavy boundary.
- Cyg2—46 to 64 inches; light olive gray (5Y 6/2) silty clay loam, olive gray (5Y 4/2) moist; massive; very hard, firm, slightly sticky and slightly plastic; few very fine tubular pores; 14 percent calcium carbonate equivalent; common fine nests of gypsum; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations and few fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; strongly alkaline; gradual wavy boundary.
- 2Cyg3—64 to 80 inches; light gray (5Y 7/2) clay loam, olive gray (5Y 5/2) moist; massive; very hard, firm, slightly sticky and slightly plastic; few very fine tubular pores; 14 percent calcium carbonate equivalent; common fine nests of gypsum and few fine soft masses of iron-manganese; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; 2 percent pebbles; strongly effervescent; strongly alkaline.

Range in Characteristics

Mollic epipedon thickness: Greater than 24 inches

Depth to carbonates: At the surface

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: 0 to 7 inches

Remarks: Some pedons have a Bkz horizon.

Az horizon:

Hue - 10YR, 2.5Y, 5Y, or neutral; value - 3 to 5 (2 or 3 moist); and chroma - 0 or 1
Texture - silty clay loam but is silt loam in some pedons

Bz horizon:

Hue - 10YR, 2.5Y, 5Y, or neutral; value - 3 to 7 (2 to 4 moist); and chroma - 0 or 1
Texture - silty clay loam or silt loam

Cg horizon:

Hue - 2.5Y, 5Y or neutral; value - 5 to 7 (3 to 6 moist); and chroma - 0 to 2
Texture - silty clay loam or clay loam

Prosper Series

Depth to restrictive feature: None

Drainage class: Moderately well drained

Permeability: Moderately slow

Landform: Till plains

Parent material: Loamy glacial till

Slope: 0 to 6 percent

Typical Pedon

Prosper loam, in an area of Houdek-Ethan-Prosper loams, 1 to 6 percent slopes, 620 feet north and 270 feet west of the southeast corner of sec. 14, T. 114 N., R. 60 W.; USGS Carpenter, SD topographic quadrangle; lat. 44 degrees 40 minutes 35 seconds N. and long. 97 degrees 59 minutes 55 seconds W.

- A—0 to 8 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak fine granular structure; slightly hard, friable; many very fine and fine roots throughout; common very fine tubular pores; slightly alkaline; clear smooth boundary.
- Bt1—8 to 20 inches; very dark grayish brown (10YR 3/2) clay loam, very dark brown (10YR 2/2) moist; moderate medium prismatic structure parting to moderate fine subangular blocky; hard, friable, slightly sticky and slightly plastic; common very fine and fine roots throughout; common very fine tubular pores; clay films on vertical faces of peds; slightly alkaline; clear smooth boundary.
- Bt2—20 to 30 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate fine subangular blocky; hard, friable, slightly sticky and slightly plastic; few very fine and fine roots throughout; common very fine tubular pores; clay films on vertical faces of peds; slightly alkaline; clear smooth boundary.
- Bk—30 to 39 inches; light yellowish brown (2.5Y 6/3) clay loam, olive brown (2.5Y 4/3) moist; weak fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few very fine and fine roots throughout; common very fine tubular pores; 18 percent calcium carbonate equivalent; common fine and medium soft masses of carbonate; few fine prominent dark yellowish brown (10YR 4/6) redox concentrations and few fine prominent gray (10YR 5/1) redox depletions; 1 percent pebbles; strongly effervescent; moderately alkaline; clear smooth boundary.
- C1—39 to 56 inches; pale yellow (2.5Y 7/3) clay loam, light yellowish brown (2.5Y 6/3) moist; massive; hard, firm, sticky and plastic; few very fine tubular pores; 15 percent calcium carbonate equivalent; few fine soft masses of carbonate; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; 3 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C2—56 to 80 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, firm, sticky and plastic; few very fine tubular pores; 11 percent calcium carbonate equivalent; few iron stains; few fine soft masses of carbonate and few fine soft masses of iron-manganese; many fine prominent dark yellowish brown (10YR 4/6) redox concentrations and many fine prominent gray (10YR 5/1) redox depletions; 3 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 20 to 30 inches

Depth to carbonates: 20 to 36 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

Remarks: Some pedons have a Btk horizon.

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1 or 2

Texture - loam but is silt loam in some pedons

Bt horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 to 4 moist); and chroma - 1 to 3

Texture - clay loam

Bk horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - loam or clay loam

C horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - loam or clay loam

Putney Series

Depth to restrictive feature: None

Drainage class: Well drained

Permeability: Moderate in the solum and moderate to slow in the underlying material

Landform: Lake plains

Parent material: Silty glaciolacustrine sediments

Slope: 0 to 4 percent

Typical Pedon

Putney silt loam, in an area of Great Bend-Putney silt loams, 0 to 2 percent slopes, 1,350 feet west and 135 feet south of the northeast corner of sec. 18, T. 120 N., R. 64 W.; USGS Northville, SD topographic quadrangle; lat. 45 degrees 13 minutes 0 seconds N. and long. 98 degrees 34 minutes 47 seconds W.

Ap—0 to 7 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; weak fine granular structure; slightly hard, very friable; common very fine and fine roots throughout; few very fine tubular pores; slightly alkaline; abrupt smooth boundary.

Bw—7 to 15 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to weak medium and coarse subangular blocky; slightly hard, friable; common very fine and fine roots throughout; few very fine tubular pores; moderately alkaline; clear wavy boundary.

Bk—15 to 19 inches; light yellowish brown (2.5Y 6/3) silt loam, olive brown (2.5Y 4/3) moist; weak coarse prismatic structure parting to weak medium and coarse subangular blocky; slightly hard, friable; few very fine roots throughout; common very fine tubular pores; 21 percent calcium carbonate equivalent; few fine salt masses; violently effervescent; moderately alkaline; clear wavy boundary.

Bkz—19 to 37 inches; pale yellow (2.5Y 7/3) silt loam, light olive brown (2.5Y 5/3) moist; weak medium and coarse subangular blocky structure; slightly hard, friable; few very fine roots throughout; common very fine tubular pores; 25 percent calcium carbonate equivalent; few fine nests of gypsum and common fine salt masses; violently effervescent; moderately alkaline; clear wavy boundary.

- C1—37 to 65 inches; pale yellow (2.5Y 8/3) silt loam, light yellowish brown (2.5Y 6/3) moist; massive; slightly hard, friable; few very fine tubular pores; varved with very fine sand to clay; 14 percent calcium carbonate equivalent; few fine salt masses; few fine prominent dark yellowish brown (10YR 4/6) and few fine prominent gray (10YR 5/1) relic redox features; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C2—65 to 80 inches; pale yellow (2.5Y 8/3) silt loam, light yellowish brown (2.5Y 6/3) moist; massive; slightly hard, friable; few very fine tubular pores; varved with very fine sand to clay; 13 percent calcium carbonate equivalent; common fine and medium prominent dark yellowish brown (10YR 4/6) concentrations and few fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches

Depth to carbonates: 10 to 20 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: 10 to 20 inches

A horizon:

Hue - 10YR; value - 4 or 5 (2 or 3 moist); and chroma - 1

Texture - silt loam but is silty clay loam in some pedons

Bw horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 or 3 moist); and chroma - 1 or 2

Texture - silty clay loam or silt loam

Bk or Bkz horizon:

Hue - 10YR or 2.5Y; value - 6 to 8 (4 to 6 moist); and chroma - 1 to 4

Texture - silt loam or silty clay loam

C horizon:

Hue - 10YR or 2.5Y; value - 6 to 8 (4 to 6 moist); and chroma - 1 to 4

Texture - silt loam or silty clay loam and typically is varved with very fine sand to clay in the lower part

Ranslo Series

Depth to restrictive feature: Natric; top depth ranges from 2 to 16 inches

Drainage class: Somewhat poorly drained

Permeability: Slow

Landform: Flood plains

Parent material: Clayey alluvium

Slope: 0 to 2 percent

Typical Pedon

Ranslo silty clay loam, 0 to 1 percent slopes, 1,275 feet east and 850 feet south of the northwest corner of sec. 30, T. 117 N., R. 60 W.; USGS Doland, SD topographic quadrangle; lat. 44 degrees 55 minutes 6 seconds N. and long. 98 degrees 5 minutes 58 seconds W.

A—0 to 7 inches; dark gray (10YR 4/1) silty clay loam, black (10YR 2/1) moist; moderate medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots throughout; few very fine tubular pores; neutral; clear smooth boundary.

- E—7 to 9 inches; gray (10YR 5/1) silt loam, very dark gray (10YR 3/1) moist; weak thin platy structure parting to weak fine granular; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine tubular pores; neutral; abrupt wavy boundary.
- Btn1—9 to 13 inches; dark gray (10YR 4/1) silty clay, black (10YR 2/1) moist; strong medium columnar structure parting to moderate medium angular blocky; hard, firm, sticky and plastic; few very fine roots between peds; few very fine tubular pores; gray (10YR 5/1) coats on tops of columns and clay films on vertical faces of peds; moderately alkaline; clear smooth boundary.
- Btn2—13 to 25 inches; dark gray (10YR 4/1) silty clay, black (10YR 2/1) moist; strong medium prismatic structure parting to moderate medium angular blocky; hard, firm, sticky and plastic; few very fine roots between peds; few very fine tubular pores; clay films on vertical faces of peds; moderately alkaline; clear smooth boundary.
- Bk1—25 to 37 inches; grayish brown (2.5Y 5/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm, slightly sticky and slightly plastic; few very fine roots between peds; common very fine tubular pores; 22 percent calcium carbonate equivalent; common fine and medium soft masses of carbonate; strongly effervescent; moderately alkaline; gradual smooth boundary.
- Bk2—37 to 53 inches; light brownish gray (2.5Y 6/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; weak medium prismatic structure parting to weak medium subangular blocky; hard, firm, slightly sticky and slightly plastic; common very fine tubular pores; 19 percent calcium carbonate equivalent; common fine and medium soft masses of carbonate; strongly effervescent; strongly alkaline; gradual smooth boundary.
- Cy1—53 to 67 inches; grayish brown (2.5Y 5/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, firm, slightly sticky and slightly plastic; common very fine tubular pores; 13 percent calcium carbonate equivalent; few fine soft masses of carbonate and few fine nests of gypsum; few fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; strongly alkaline; gradual wavy boundary.
- Cy2—67 to 80 inches; light brownish gray (2.5Y 6/2) clay loam, grayish brown (2.5Y 5/2) moist; massive; hard, firm, slightly sticky and slightly plastic; common very fine tubular pores; 12 percent calcium carbonate equivalent; common fine and medium nests of gypsum and few fine soft masses of iron-manganese; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; 1 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 40 inches

Depth to carbonates: 14 to 30 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: 16 to 60 inches

Remarks: Some pedons have a Btnkz horizon.

A horizon:

Hue - 10YR; value - 4 or 5 (2 or 3 moist); and chroma - 1

Texture - silty clay loam or loam but is silt loam in some pedons

E horizon:

Hue - 10YR; value - 5 or 6 (2 to 4 moist); and chroma - 1 or 2

Texture - silt loam or loam

Btn horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 or 3 moist); and chroma - 1
Texture - silty clay loam, silty clay, or clay loam

Bkz or Bk horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 4 to 7 (3 to 6 moist); and chroma - 1 to 3
Texture - silty clay loam or clay loam but is silty clay or clay in some pedons

C horizon:

Hue - 2.5Y or 5Y; value - 4 to 7 (3 to 6 moist); and chroma - 1 to 4
Texture - clay loam or silty clay loam but is silty clay or clay in some pedons

Renshaw Series

Depth to restrictive feature: Strongly contrasting textural stratification; top depth ranges from 14 to 20 inches

Drainage class: Somewhat excessively drained

Permeability: Moderate in the loamy sediments and very rapid in the underlying gravelly material

Landform: Outwash plains

Parent material: Loamy alluvium over glacial outwash

Slope: 0 to 6 percent

Typical Pedon

Renshaw loam, in an area of Renshaw-Fordville loams, 0 to 2 percent slopes, 315 feet west and 1,400 feet north of the southeast corner of sec. 1, T. 120 N., R. 60 W.; USGS Crandall, SD topographic quadrangle; lat. 45 degrees 13 minutes 56 seconds N. and long. 97 degrees 58 minutes 57 seconds W.

Ap—0 to 7 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak fine granular structure; slightly hard, very friable; few very fine roots throughout; common very fine tubular pores; 2 percent gravel; slightly alkaline; abrupt smooth boundary.

Bw—7 to 15 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, very friable; few very fine roots throughout; common very fine tubular pores; 2 percent gravel; slightly alkaline; clear wavy boundary.

2Bk—15 to 23 inches; light brownish gray (2.5Y 6/2) gravelly loamy sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose; few very fine roots throughout; 14 percent calcium carbonate equivalent; few carbonate coats on sand and gravel; 25 percent gravel; strongly effervescent; moderately alkaline; gradual wavy boundary.

2C1—23 to 47 inches; light brownish gray (2.5Y 6/2) very gravelly loamy sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose; 15 percent calcium carbonate equivalent; very few carbonate coats on sand and gravel; 40 percent gravel; strongly effervescent; moderately alkaline; clear wavy boundary.

2C2—47 to 56 inches; pale yellow (2.5Y 7/3) coarse sand, light olive brown (2.5Y 5/3) moist; single grain; loose; 11 percent calcium carbonate equivalent; 5 percent gravel; slightly effervescent; moderately alkaline; clear wavy boundary.

2C3—56 to 80 inches; light brownish gray (2.5Y 6/2) coarse sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose; 9 percent calcium carbonate equivalent; strongly effervescent; 10 percent gravel; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches

Depth to carbonates: 14 to 20 inches

Depth to contrasting parent material: 14 to 20 inches over gravelly material

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1

Texture - loam

Bw horizon:

Hue - 10YR; value - 3 to 5 (3 or 4 moist); and chroma - 1 to 4

Texture - loam but is sandy loam in some pedons

2Bk or 2C horizon:

Hue - 10YR or 2.5Y; value - 4 to 7 (3 to 6 moist); and chroma - 2 to 4

Texture - gravelly loamy sand, very gravelly loamy sand, gravelly sand, very gravelly sand, gravelly coarse sand, very gravelly coarse sand, or coarse sand

Rimlap Series

Depth to restrictive feature: None

Drainage class: Poorly drained

Permeability: Very slow

Landform: Till plains

Parent material: Local clayey alluvium over loamy glacial till

Slope: 0 to 1 percent

Typical Pedon

Rimlap silt loam (fig. 28), in an area of Tonka-Rimlap silt loams, 0 to 1 percent slopes, 1,850 feet east and 1,150 feet south of the northwest corner of sec. 7, T. 117 N., R. 65 W.; USGS Zell, SD topographic quadrangle; lat. 45 degrees 58 minutes 0 seconds N. and long. 98 degrees 42 minutes 34 seconds W.

A1—0 to 2 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; common medium roots and many very fine and fine throughout; common very fine tubular pores; slightly acid; clear smooth boundary.

A2—2 to 6 inches; gray (10YR 5/1) silt loam, very dark gray (10YR 3/1) moist; weak medium subangular blocky structure parting to moderate fine granular; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots throughout; common very fine tubular pores; common fine prominent dark yellowish brown (10YR 4/4) redox concentrations; slightly acid; clear smooth boundary.

E—6 to 10 inches; light gray (10YR 7/1) silt loam, dark gray (10YR 4/1) moist; moderate very thin platy and moderate thin platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots throughout; common very fine tubular pores; few fine iron-manganese concretions; many fine prominent dark yellowish brown (10YR 4/4) redox concentrations; neutral; abrupt smooth boundary.

Bt1—10 to 17 inches; dark gray (10YR 4/1) silty clay, black (10YR 2/1) moist; weak medium columnar structure parting to moderate fine and medium angular blocky; very hard, very firm, very sticky and very plastic; common very fine roots between peds; few very fine tubular pores; light gray (10YR 7/1) coats on tops of columns and clay films on vertical faces of peds; neutral; gradual smooth boundary.

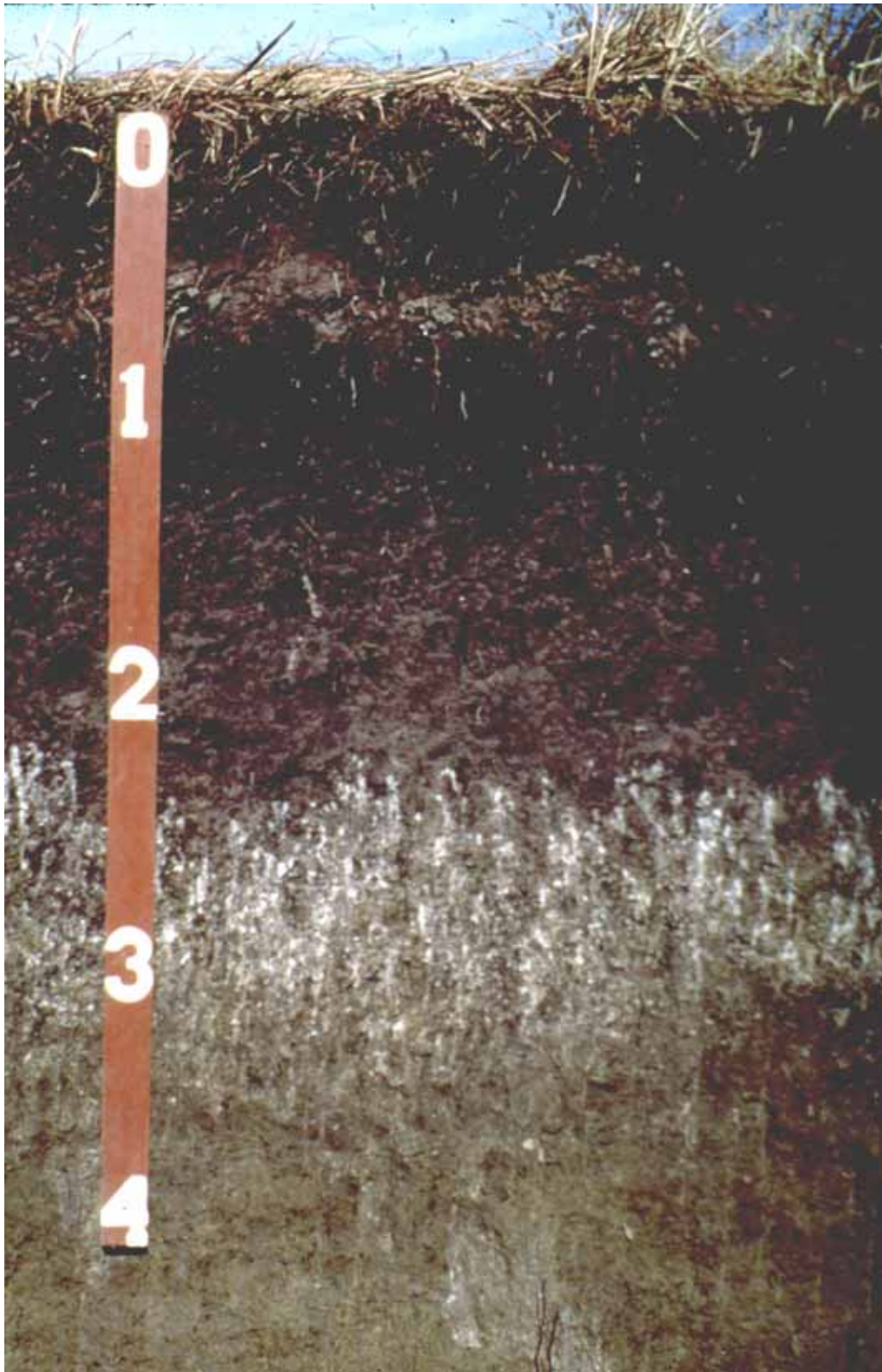


Figure 28. Profile of Rimlap silt loam. Calcium carbonate is at a depth of about 29 inches. This soil is poorly drained. Depth is marked in feet.

- Bt2**—17 to 29 inches; dark gray (10YR 4/1) silty clay, black (10YR 2/1) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; very hard, very firm, very sticky and very plastic; common very fine roots between peds; few very fine tubular pores; clay films on vertical faces of peds; slightly alkaline; clear smooth boundary.
- Btk**—29 to 39 inches; dark gray (2.5Y 4/1) silty clay loam, very dark gray (2.5Y 3/1) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; very hard, firm, sticky and plastic; few very fine roots throughout; few very fine tubular pores; 9 percent calcium carbonate equivalent; clay films on vertical faces of peds; many medium and coarse soft masses of carbonate; common fine prominent dark yellowish brown (10YR 4/4) redox concentrations; strongly effervescent; moderately alkaline; gradual smooth boundary.
- Bk**—39 to 45 inches; light brownish gray (2.5Y 6/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; weak medium prismatic structure parting to moderate medium subangular blocky; hard, firm, sticky and plastic; few very fine roots throughout; common very fine tubular pores; 12 percent calcium carbonate equivalent; common medium soft masses of carbonate and few fine soft masses of iron-manganese; common fine prominent dark yellowish brown (10YR 4/4) redox concentrations and few fine distinct gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline; gradual smooth boundary.
- C1**—45 to 55 inches; light gray (2.5Y 7/2) loam, grayish brown (2.5Y 5/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine tubular pores; 8 percent calcium carbonate equivalent; common fine soft masses of iron-manganese; many fine and medium prominent yellowish brown (10YR 5/6) redox concentrations and common fine distinct gray (10YR 5/1) redox depletions; slightly effervescent; moderately alkaline; clear smooth boundary.
- 2C2**—55 to 80 inches; light yellowish brown (2.5Y 6/4) loam, olive brown (2.5Y 4/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine tubular pores; 6 percent calcium carbonate equivalent; many fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations and many fine and medium prominent gray (10YR 6/1) redox depletions; 2 percent pebbles; slightly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 24 to 50 inches

Depth to carbonates: 24 to 50 inches

Depth to contrasting parent material: Greater than 40 inches over glacial till

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 1 or 2

Texture - silt loam but is loam or silty clay loam in some pedons

E horizon:

Hue - 10YR; value - 5 to 7 (4 or 5 moist); and chroma - 1 or 2

Texture - silt loam but is loam or silty clay loam in some pedons

Bt horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 or 3 moist); and chroma - 1 or 2

Texture - silty clay, clay, or silty clay loam

Bk horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 4 to 6 (3 to 5 moist); and chroma - 2 or 3

Texture - silty clay loam, clay loam, or silty clay

C or 2C horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (4 or 5 moist); and chroma - 2 to 4

Texture - loam, clay loam, or silty clay loam

Rondell Series

Depth to restrictive feature: None

Drainage class: Moderately well drained

Permeability: Moderate in the solum and moderate to slow in the underlying material

Landform: Lake plains

Parent material: Silty glaciolacustrine sediments

Slope: 0 to 3 percent

Typical Pedon

Rondell silt loam, in an area of Beotia-Rondell silt loams, 0 to 3 percent slopes, 2,550 feet north and 350 feet east of the southwest corner of sec. 4, T. 115 N., R. 63 W.; USGS Frankfort SW, SD topographic quadrangle; lat. 44 degrees 47 minutes 54 seconds N. and long. 98 degrees 25 minutes 16 seconds W.

- Ap—0 to 7 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; weak fine subangular blocky structure parting to weak fine granular; slightly hard, very friable; common very fine and fine roots throughout; few very fine tubular pores; 5 percent calcium carbonate equivalent; slightly effervescent; moderately alkaline; abrupt smooth boundary.
- A—7 to 11 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; slightly hard, very friable; common very fine roots throughout; few very fine tubular pores; 5 percent calcium carbonate equivalent; strongly effervescent; moderately alkaline; clear smooth boundary.
- Bk1—11 to 21 inches; light gray (2.5Y 7/2) silt loam, light brownish gray (2.5Y 6/2) moist; weak fine and medium subangular blocky structure; slightly hard, very friable; few very fine roots throughout; common very fine tubular pores; 28 percent calcium carbonate equivalent; violently effervescent; strongly alkaline; gradual wavy boundary.
- Bk2—21 to 36 inches; light yellowish brown (2.5Y 6/3) silt loam, olive brown (2.5Y 4/3) moist; weak fine and medium subangular blocky structure; slightly hard, very friable; few very fine roots throughout; common very fine tubular pores; 18 percent calcium carbonate equivalent; violently effervescent; strongly alkaline; gradual wavy boundary.
- C1—36 to 55 inches; light yellowish brown (2.5Y 6/3) silt loam, light olive brown (2.5Y 5/3) moist; massive; soft, very friable; few very fine tubular pores; varved; 10 percent calcium carbonate equivalent; common fine prominent dark yellowish brown (10YR 4/4) redox concentrations and few fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C2—55 to 80 inches; light yellowish brown (2.5Y 6/3) silt loam, light olive brown (2.5Y 5/3) moist; massive; soft, very friable; few very fine tubular pores; varved; 11 percent calcium carbonate equivalent; common fine prominent dark yellowish brown (10YR 4/4) redox concentrations and many fine and medium prominent gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 15 inches

Depth to carbonates: 0 to 5 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 30 inches

A horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 1 or 2

Texture - silt loam but is silty clay loam in some pedons

Bk horizon:

Hue - 2.5Y or 5Y; value - 6 to 8 (4 to 6 moist); and chroma - 2 to 4

Texture - silt loam or silty clay loam

C horizon:

Hue - 2.5Y or 5Y; value - 5 to 8 (4 to 6 moist); and chroma - 2 to 4

Texture - silt loam or silty clay loam and typically is varved with very fine sand to clay in the lower part

Shue Series

Depth to restrictive feature: None

Drainage class: Poorly drained

Permeability: Rapid in the sandy sediments and moderately slow in the underlying glacial till

Landform: Till plains

Parent material: Sandy eolian sediments over loamy glacial till

Slope: 0 to 1 percent

Typical Pedon

Shue loamy fine sand (fig. 29), in an area of lpage-Els-Shue complex, 0 to 6 percent slopes, 2,000 feet north and 1,850 feet east of the southwest corner of sec. 32, T. 114 N., R. 64 W.; USGS Hitchcock, SD topographic quadrangle; lat. 44 degrees 38 minutes 19 seconds N. and long. 98 degrees 26 minutes 9 seconds W.

Ap—0 to 8 inches; dark gray (10YR 4/1) loamy fine sand, black (10YR 2/1) moist; weak fine granular structure; soft, very friable; common very fine and fine roots throughout; few very fine tubular pores; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations; neutral; abrupt smooth boundary.

AC—8 to 13 inches; dark grayish brown (10YR 4/2) loamy fine sand, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure; soft, very friable; few very fine roots throughout; few very fine tubular pores; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations; neutral; gradual wavy boundary.

C1—13 to 26 inches; light yellowish brown (2.5Y 6/3) fine sand, olive brown (2.5Y 4/3) moist; single grain; loose; few very fine roots throughout; many fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations; neutral; clear wavy boundary.

2Cg1—26 to 46 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; very hard, firm, sticky and plastic; few very fine tubular pores; 5 percent calcium carbonate equivalent; few fine soft masses of iron-manganese; many fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine prominent gray (10YR 6/1)

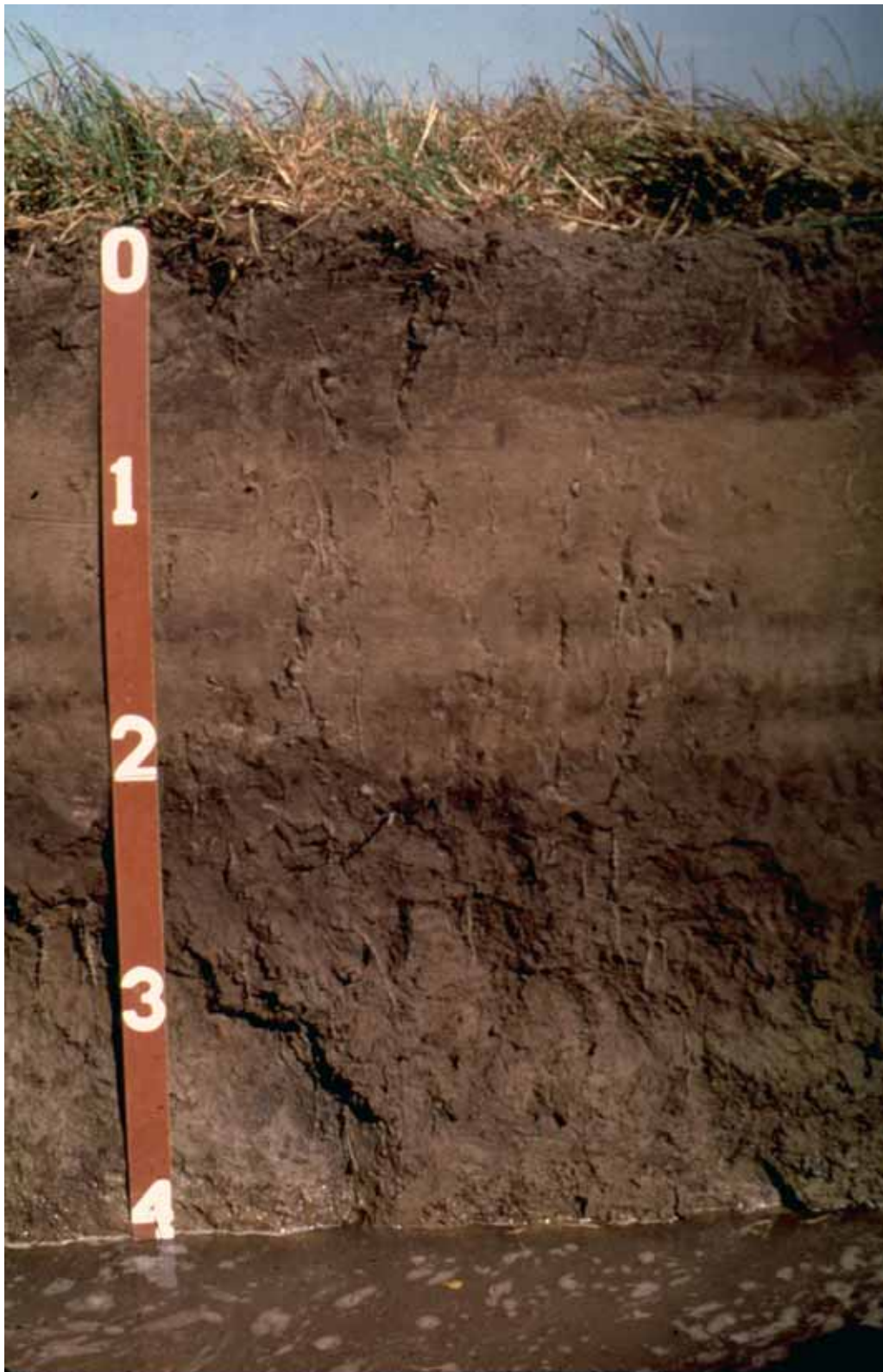


Figure 29. Profile of Shue loamy fine sand. There is about 35 inches of loamy fine sand and fine sand material over glacial till. Depth is marked in feet.

redox depletions; 1 percent pebbles; slightly effervescent; slightly alkaline; gradual wavy boundary.

2Cg2—46 to 80 inches; light gray (2.5Y 7/2) clay loam, grayish brown (2.5Y 5/2) moist; massive; very hard, firm, sticky and plastic; few very fine tubular pores; 14 percent calcium carbonate equivalent; common fine soft masses of iron-manganese and few fine soft masses of carbonate; many fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations and many fine prominent gray (10YR 6/1) redox depletions; 1 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 10 to 16 inches

Depth to carbonates: 20 to 40 inches

Depth to contrasting parent material: 20 to 40 inches over glacial till

Depth to gypsum and other visible salts other than carbonates: Greater than 30 inches

A horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 1 or 2

Texture - loamy fine sand but is loamy sand, sandy loam, or fine sand in some pedons

C horizon:

Hue - 10YR or 2.5Y; value - 4 to 6 (3 or 4 moist); and chroma - 2 to 4

Texture - fine sand, loamy fine sand, or loamy sand

2C horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - clay loam or loam

Southam Series

Depth to restrictive feature: None

Drainage class: Very poorly drained

Permeability: Slow

Landform: Till plains

Parent material: Local clayey alluvium

Slope: 0 to 1 percent

Typical Pedon

Southam silty clay loam, 0 to 1 percent slopes, 2,350 feet south and 110 feet east of the northwest corner of sec. 31, T. 123 N., R. 56 W., in Day County; Oldham NE, SD topographic quadrangle; lat. 45 degrees 25 minutes 18 seconds N. and long. 97 degrees 36 minutes 41 seconds W.

A—0 to 7 inches; very dark gray (N 3/0) silty clay loam, black (N 2/0) moist; weak medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; many fine and medium roots throughout; few very fine tubular pores; slightly effervescent; slightly alkaline; clear smooth boundary.

Ag1—7 to 26 inches; dark gray (N 4/0) silty clay loam, very dark gray (N 3/0) moist; weak coarse subangular blocky structure parting to moderate medium subangular blocky; hard, friable, sticky and plastic; common fine roots throughout; few very fine tubular pores; common fine snail shell fragments; strongly effervescent; slightly alkaline; clear wavy boundary.

Ag2—26 to 51 inches; dark gray (5Y 4/1) silty clay, very dark gray (5Y 3/1) moist; weak coarse subangular blocky structure; hard, firm, sticky and plastic; few very fine tubular pores; common fine snail shell fragments; strongly effervescent; slightly alkaline; gradual wavy boundary.

Cg—51 to 60 inches; gray (5Y 5/1) silty clay, dark gray (5Y 4/1) moist; massive; very hard, very firm, very sticky and very plastic; few very fine tubular pores; many coarse distinct olive (5Y 4/3) redox concentrations; strongly effervescent; slightly alkaline.

Range in Characteristics

Mollic epipedon thickness: 24 to 60 inches

Depth to carbonates: 0 to 10 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 25 inches

A horizon:

Hue - 10YR, 2.5Y, 5Y, or neutral; value - 3 to 5 (2 or 3 moist); and chroma - 0 to 2
Texture - silty clay loam but is silty clay or clay loam in some pedons

C horizon:

Hue - 2.5Y, 5Y, 5GY, or neutral; value - 4 to 8 (3 to 7 moist); and chroma - 0 to 2
Texture - silty clay but is silty clay loam, clay loam, or clay in some pedons

Stickney Series

Depth to restrictive feature: None

Drainage class: Moderately well drained

Permeability: Slow

Landform: Till plains

Parent material: Loamy glacial till

Slope: 0 to 2 percent

Typical Pedon

Stickney silt loam, in an area of Stickney-Dudley silt loams, 0 to 2 percent slopes, 1,000 feet north and 420 feet west of the southeast corner of sec. 35, T. 115 N., R. 61 W.; USGS Bloomfield, SD topographic quadrangle; lat. 44 degrees 43 minutes 18 seconds N. and long. 98 degrees 7 minutes 16 seconds W.

A—0 to 7 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; weak fine granular structure; slightly hard, friable; many very fine and fine roots throughout; common very fine tubular pores; slightly acid; abrupt smooth boundary.

E—7 to 10 inches; gray (10YR 5/1) silt loam, very dark gray (10YR 3/1) moist; weak thin platy structure; slightly hard, friable; common very fine and fine roots throughout; many very fine tubular pores; slightly acid; clear smooth boundary.

BE—10 to 13 inches; dark grayish brown (10YR 4/2) and gray (10YR 5/1) silty clay loam, very dark grayish brown (10YR 3/2) and very dark gray (10YR 3/1) moist; weak fine prismatic structure parting to weak fine subangular blocky; hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; many very fine tubular pores; neutral; clear smooth boundary.

Btn—13 to 22 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure; very hard, firm, sticky and plastic; common very fine roots between peds; few very fine tubular pores; clay films on vertical faces of peds; slightly alkaline; clear wavy boundary.

- Bkz**—22 to 31 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak fine and medium subangular blocky structure; very hard, friable, sticky and plastic; few very fine roots throughout; few very fine tubular pores; 17 percent calcium carbonate equivalent; common fine and medium soft masses of carbonate and common fine salt masses; strongly effervescent; moderately alkaline; clear wavy boundary.
- Bk**—31 to 40 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak fine and medium subangular blocky structure; very hard, friable, sticky and plastic; few very fine tubular pores; 14 percent calcium carbonate equivalent; common fine soft masses of carbonate; few fine prominent dark yellowish brown (10YR 4/4) redox concentrations and few fine distinct gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C1**—40 to 64 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; very hard, firm, sticky and plastic; few very fine tubular pores; 10 percent calcium carbonate equivalent; few iron stains; few fine soft masses of carbonate and few fine soft masses of iron-manganese; common fine prominent dark yellowish brown (10YR 4/4) redox concentrations and common fine distinct gray (10YR 5/1) redox depletions; strongly effervescent; 2 percent pebbles; moderately alkaline; gradual wavy boundary.
- C2**—64 to 80 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; massive; very hard, firm, sticky and plastic; few very fine tubular pores; 8 percent calcium carbonate equivalent; few iron stains; few fine soft masses of iron-manganese; many fine and medium distinct dark yellowish brown (10YR 4/4) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; 2 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 20 to 40 inches

Depth to carbonates: 20 to 49 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 20 inches

A horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 1 or 2

Texture - silt loam but is loam or silty clay loam in some pedons

E horizon:

Hue - 10YR; value - 5 or 6 (3 or 4 moist); and chroma - 1 to 3

Texture - silt loam, loam, or silty clay loam

B/E or BE horizon:

Hue - 10YR; value - 3 to 6 (2 to 4 moist); and chroma - 1 to 3

Texture - silty clay loam

Btn horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 to 4 moist); and chroma - 1 to 3

Texture - clay loam, silty clay loam, silty clay, or clay

Bkz or Bk horizon:

Hue - 2.5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 or 3

Texture - clay loam or silty clay loam

C horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - clay loam or loam

Straw Series

Depth to restrictive feature: None

Drainage class: Well drained

Permeability: Moderate

Landform: Flood plains

Parent material: Loamy alluvium

Slope: 0 to 2 percent

Typical Pedon

Straw loam, channeled, 300 feet west and 290 feet south of the northeast corner of sec. 33, T. 118 N., R. 65 W.; USGS Zell, SD topographic quadrangle; lat. 44 degrees 59 minutes 54 seconds N. and long. 98 degrees 39 minutes 23 seconds W.

- A1—0 to 9 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak fine granular structure; slightly hard, friable; many very fine and fine roots throughout; common very fine and fine tubular pores; 3 percent calcium carbonate equivalent; slightly effervescent; slightly alkaline; clear smooth boundary.
- A2—9 to 25 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure parting to weak fine granular; slightly hard, friable; common very fine and fine roots throughout; common very fine and fine tubular pores; 5 percent calcium carbonate equivalent; strongly effervescent; slightly alkaline; clear wavy boundary.
- Bk—25 to 41 inches; light brownish gray (10YR 6/2) loam, dark grayish brown (10YR 4/2) moist; weak medium and coarse prismatic structure parting to weak fine and medium subangular blocky; slightly hard, friable; common very fine roots throughout; common very fine and fine tubular pores; 12 percent calcium carbonate equivalent; strongly effervescent; moderately alkaline; clear wavy boundary.
- Ab—41 to 47 inches; dark gray (10YR 4/1) loam, very dark brown (10YR 2/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable; few very fine roots throughout; few very fine tubular pores; 4 percent calcium carbonate equivalent; slightly effervescent; slightly alkaline; clear wavy boundary.
- C1—47 to 61 inches; grayish brown (10YR 5/2) loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable; few very fine roots throughout; common very fine tubular pores; 7 percent calcium carbonate equivalent; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C2—61 to 80 inches; light brownish gray (10YR 6/2) loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable; common very fine and fine tubular pores; 6 percent calcium carbonate equivalent; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 to 40 inches

Depth to carbonates: 0 to 25 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 or 3 moist); and chroma - 2 or 3

Texture - loam but is clay loam or silt loam in some pedons

Bk horizon:

Hue - 10YR or 2.5Y; value - 4 to 6 (3 to 5 moist); and chroma - 2 to 4
Texture - loam but is clay loam in some pedons

C horizon:

Hue - 10YR or 2.5Y; value - 5 or 6 (4 or 5 moist); and chroma - 2 to 4
Texture - loam, silt loam, or clay loam but is stratified sandy loam or fine sandy loam in some pedons

Talmo Series

Depth to restrictive feature: Strongly contrasting textural stratification; top depth ranges from 5 to 14 inches

Drainage class: Excessively drained

Permeability: Very rapid

Landform: Till plains and moraines

Parent material: Glacial outwash

Slope: 2 to 40 percent

Typical Pedon

Talmo gravelly loam, in an area of Hand-Talmo complex, 2 to 6 percent slopes, 2,300 feet north and 2,350 feet east of the southwest corner of sec. 14, T. 115 N., R. 64 W.; USGS Frankfort SW, SD topographic quadrangle; lat. 44 degrees 46 minutes 12 seconds N. and long. 98 degrees 29 minutes 42 seconds W.

- Ap—0 to 7 inches; dark gray (10YR 4/1) gravelly loam, black (10YR 2/1) moist; single grain; loose; few very fine and fine roots throughout; 9 percent calcium carbonate equivalent; very few carbonate coats on sand and gravel; 20 percent gravel; strongly effervescent; slightly alkaline; abrupt smooth boundary.
- 2C1—7 to 58 inches; light yellowish brown (2.5Y 6/3) very gravelly loamy sand, olive brown (2.5Y 4/3) moist; single grain; loose; 14 percent calcium carbonate equivalent; few carbonate coats on sand and gravel; 40 percent gravel; strongly effervescent; moderately alkaline; gradual wavy boundary.
- 2C2—58 to 80 inches; light yellowish brown (2.5Y 6/3) very gravelly sand, olive brown (2.5Y 4/3) moist; single grain; loose; 12 percent calcium carbonate equivalent; few carbonate coats on sand and gravel and few iron stains on sand and gravel; 40 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 14 inches

Depth to carbonates: 0 to 14 inches

Depth to contrasting parent material: 5 to 14 inches over very gravelly material

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 1 or 2
Texture - gravelly loam but is loam, gravelly sandy loam, or sandy loam in some pedons

2C horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4
Texture - very gravelly sand, very gravelly loamy sand, extremely gravelly loamy sand, or extremely gravelly sand

Tetonka Series

Depth to restrictive feature: None

Drainage class: Poorly drained

Permeability: Slow

Landform: Till plains

Parent material: Local clayey alluvium

Slope: 0 to 1 percent

Typical Pedon

Tetonka silt loam, in an area of Houdek-Stickney-Tetonka complex, 0 to 2 percent slopes, 1,650 feet west and 250 feet north of the southeast corner of sec. 10, T. 114 N., R. 60 W.; USGS Bloomfield, SD topographic quadrangle; lat. 44 degrees 41 minutes 28 seconds N. and long. 98 degrees 1 minutes 31 seconds W.

- A—0 to 8 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium granular structure; slightly hard, very friable; many very fine roots throughout; common very fine tubular pores; neutral; abrupt smooth boundary.
- E—8 to 13 inches; light gray (10YR 7/1) silt loam, gray (10YR 5/1) moist; moderate thin platy structure; slightly hard, very friable; common very fine roots throughout; many very fine tubular pores; common fine distinct light yellowish brown (10YR 6/4) redox concentrations; neutral; clear smooth boundary.
- Bt1—13 to 25 inches; dark gray (10YR 4/1) silty clay, black (10YR 2/1) moist; moderate fine and medium prismatic structure; very hard, firm, sticky and plastic; common very fine roots throughout; few very fine tubular pores; clay films on vertical faces of peds; slightly alkaline; clear smooth boundary.
- Bt2—25 to 39 inches; gray (10YR 5/1) silty clay, very dark gray (10YR 3/1) moist; moderate fine and medium subangular blocky structure; very hard, firm, sticky and plastic; few very fine roots throughout; few very fine tubular pores; clay films on vertical faces of peds; slightly alkaline; clear smooth boundary.
- Bk—39 to 47 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak fine and medium subangular blocky structure; very hard, firm, sticky and plastic; common very fine tubular pores; 12 percent calcium carbonate equivalent; many fine and medium soft masses of carbonate; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations and few fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline; gradual wavy boundary.
- Bkg—47 to 62 inches; light olive gray (5Y 6/2) clay loam, olive gray (5Y 4/2) moist; weak fine and medium subangular blocky structure; very hard, firm, sticky and plastic; common very fine tubular pores; 15 percent calcium carbonate equivalent; common fine soft masses of carbonate; many fine prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; 1 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
- Cg—62 to 80 inches; pale olive (5Y 6/3) clay loam, olive (5Y 4/3) moist; massive; very hard, firm, sticky and plastic; few very fine tubular pores; 12 percent calcium carbonate equivalent; few fine soft masses of carbonate and few fine soft masses of iron-manganese; many fine prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; 1 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 24 to 50 inches

Depth to carbonates: Greater than 30 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 50 inches

A horizon:

Hue - 10YR; value - 4 or 5 (2 or 3 moist); and chroma - 1 or 2

Texture - silt loam but is silty clay loam in some pedons

E horizon:

Hue - 10YR; value - 5 to 7 (3 to 5 moist); and chroma - 1 or 2

Texture - silt loam but is silty clay loam in some pedons

Bt horizon:

Hue - 10YR, 2.5Y, 5Y, or neutral; value - 4 to 6 (2 to 4 moist); and chroma - 0 to 2

Texture - clay, silty clay, silty clay loam, or clay loam

Bk or Bkg horizon:

Hue - 2.5Y, 5Y, or neutral; value - 5 to 7 (4 or 5 moist); and chroma - 0 to 2

Texture - clay loam, silty clay loam, clay, or silty clay

Cg horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 1 to 4

Texture - clay loam, silty clay loam, clay, or silty clay

Toko Series

Depth to restrictive feature: None

Drainage class: Poorly and very poorly drained

Permeability: Moderately slow

Landform: Till plains

Parent material: Loamy glaciofluvial sediments over loamy glacial till

Slope: 0 to 1 percent

Typical Pedon

Toko fine sandy loam, 0 to 1 percent slopes, 380 feet north and 325 feet east of the southwest corner of sec. 29, T. 115 N., R. 64 W.; USGS Tulare, SD topographic quadrangle; lat. 44 degrees 44 minutes 7 seconds N. and long. 98 degrees 33 minutes 46 seconds W.

Ap—0 to 8 inches; dark gray (10YR 4/1) fine sandy loam, black (10YR 2/1) moist; weak fine granular structure; soft, very friable; many very fine and fine roots throughout; common very fine tubular pores; few fine prominent dark yellowish brown (10YR 4/6) redox concentrations; neutral; abrupt smooth boundary.

E—8 to 11 inches; light brownish gray (10YR 6/2) sandy loam, dark grayish brown (10YR 4/2) moist; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations; weak thin platy structure; soft, very friable; common very fine and fine roots throughout; common very fine and fine tubular pores; few fine iron-manganese concretions; slightly alkaline; clear smooth boundary.

Bt1—11 to 18 inches; gray (10YR 5/1) sandy clay loam, very dark gray (10YR 3/1) moist; moderate medium and coarse prismatic structure parting to moderate fine and medium subangular blocky; hard, firm, slightly sticky and slightly plastic; common very fine and fine roots throughout; few very fine tubular pores; few

- manganese or iron-manganese stains throughout and clay films on vertical faces of peds; few fine iron-manganese concretions; few fine prominent dark yellowish brown (10YR 4/6) redox concentrations; slightly alkaline; clear wavy boundary.
- Bt2**—18 to 28 inches; grayish brown (10YR 5/2) sandy clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium and coarse prismatic structure parting to moderate fine and medium subangular blocky; hard, firm, slightly sticky and slightly plastic; few very fine roots throughout; few very fine tubular pores; common manganese or iron-manganese stains throughout and clay films on vertical faces of peds; few fine iron-manganese concretions; few fine prominent dark yellowish brown (10YR 4/6) redox concentrations; slightly alkaline; clear wavy boundary.
- Bk**—28 to 38 inches; light gray (2.5Y 7/2) sandy loam, grayish brown (2.5Y 5/2) moist; weak fine subangular blocky structure; soft, very friable; few very fine roots throughout; few very fine tubular pores; 11 percent calcium carbonate equivalent; common manganese or iron-manganese stains throughout; common fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C1**—38 to 56 inches; light yellowish brown (2.5Y 6/3) loamy sand, olive brown (2.5Y 4/3) moist; single grain; loose; 8 percent calcium carbonate equivalent; common manganese or iron-manganese stains throughout; many fine and medium distinct dark yellowish brown (10YR 4/4) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; moderately alkaline; gradual wavy boundary.
- 2C2**—56 to 80 inches; light gray (2.5Y 7/2) clay loam, grayish brown (2.5Y 5/2) moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine tubular pores; 12 percent calcium carbonate equivalent; few fine soft masses of iron-manganese; common fine and medium prominent dark yellowish brown (10YR 4/4) redox concentrations and many fine and medium distinct gray (10YR 5/1) redox depletions; 2 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 15 to 40 inches

Depth to carbonates: Greater than 25 inches

Depth to contrasting parent material: Greater than 20 inches over glacial till

Depth to gypsum and other visible salts other than carbonates: Greater than 40 inches

A horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 1

Texture - fine sandy loam but is loam or sandy loam in some pedons

E horizon:

Hue - 10YR; value - 5 to 7 (3 to 5 moist); and chroma - 1 or 2

Texture - fine sandy loam, sandy loam, loamy fine sand, or loamy sand

Bt horizon:

Hue - 10YR or 2.5Y; value - 4 to 7 (3 to 5 moist); and chroma - 1 or 2

Texture - sandy clay loam, sandy loam, fine sandy loam, loam, or clay loam

Bk or C horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 5 to 8 (4 to 6 moist); and chroma - 1 to 4

Texture - loam, fine sandy loam, sandy loam, sandy clay loam, or clay loam but is loamy sand or loamy fine sand in some pedons

2C horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 6 to 8 (4 to 6 moist); and chroma - 1 to 4

Texture - clay loam or loam

Tonka Series

Depth to restrictive feature: None

Drainage class: Poorly drained

Permeability: Slow

Landform: Till plains and lake plains

Parent material: Local clayey alluvium

Slope: 0 to 1 percent

Typical Pedon

Tonka silt loam, in an area of Forman-Cresbard-Tonka complex, 0 to 2 percent slopes, 925 feet north and 475 feet west of the southeast corner of sec. 8, T. 115 N., R. 60 W.; USGS Doland SE, SD topographic quadrangle; lat. 44 degrees 46 minutes 46 seconds N. and long. 98 degrees 3 minutes 36 seconds W.

- Ap—0 to 8 inches; dark gray (10YR 4/1) silt loam, very dark gray (10YR 3/1) moist; weak fine subangular blocky structure parting to weak fine granular; slightly hard, very friable; many very fine roots throughout; common very fine tubular pores; neutral; abrupt smooth boundary.
- E—8 to 16 inches; light gray (10YR 7/1) silt loam, gray (10YR 5/1) moist; moderate thin platy structure; slightly hard, very friable; common very fine roots throughout; many very fine and fine tubular pores; common fine iron-manganese concretions; common fine distinct dark yellowish brown (10YR 4/4) redox concentrations; neutral; clear smooth boundary.
- Bt1—16 to 35 inches; dark gray (10YR 4/1) silty clay, black (10YR 2/1) moist; moderate fine and medium prismatic structure; very hard, firm, sticky and plastic; few very fine roots throughout; few very fine tubular pores; clay films on vertical faces of pedis; slightly alkaline; clear smooth boundary.
- Bt2—35 to 41 inches; gray (10YR 5/1) silty clay, very dark gray (10YR 3/1) moist; moderate medium prismatic structure parting to weak fine subangular blocky; very hard, firm, sticky and plastic; few very fine tubular pores; clay films on vertical faces of pedis; slightly alkaline; clear smooth boundary.
- Cg1—41 to 68 inches; light gray (5Y 7/2) clay loam, olive gray (5Y 5/2) moist; massive; very hard, firm, sticky and plastic; few very fine tubular pores; 7 percent calcium carbonate equivalent; common fine soft masses of iron-manganese; many fine prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; 1 percent pebbles; slightly effervescent; slightly alkaline; gradual wavy boundary.
- Cg2—68 to 80 inches; pale yellow (5Y 7/3) clay loam, olive (5Y 5/3) moist; massive; very hard, firm, sticky and plastic; common very fine tubular pores; 7 percent calcium carbonate equivalent; many fine prominent dark yellowish brown (10YR 4/6) redox concentrations and many fine and medium prominent gray (10YR 5/1) redox depletions; 1 percent pebbles; slightly effervescent; slightly alkaline.

Range in Characteristics

Mollic epipedon thickness: 20 to 50 inches

Depth to carbonates: Greater than 20 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR or neutral; value - 3 to 5 (2 or 3 moist); and chroma - 0 or 1
Texture - silt loam but is silty clay loam in some pedons

E horizon:

Hue - 10YR, 2.5Y, or neutral; value - 5 to 7 (3 to 5 moist); and chroma - 0 to 2
Texture - silt loam or silty clay loam

Bt horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 3 to 5 (2 to 4 moist); and chroma - 1 or 2
Texture - silty clay loam, silty clay, or clay loam

Cg horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 3 to 7 (2 to 6 moist); and chroma - 1 to 6
Texture - silty clay loam or clay loam but is silty clay in some pedons

Turton Series

Depth to restrictive feature: Natric; top depth ranges from 9 to 22 inches

Drainage class: Moderately well drained

Permeability: Slow

Landform: Lake plains

Parent material: Silty and loamy glaciolacustrine sediments

Slope: 0 to 2 percent

Typical Pedon

Turton very fine sandy loam, in an area of Gardena-Turton very fine sandy loams, 0 to 2 percent slopes, 75 feet west and 1,050 feet south of the northeast corner of sec. 36, T. 120 N., R. 62 W.; USGS Randolph, SD topographic quadrangle; lat. 45 degrees 10 minutes 5 seconds N. and long. 98 degrees 13 minutes 40 seconds W.

- Ap—0 to 8 inches; dark gray (10YR 4/1) very fine sandy loam, black (10YR 2/1) moist; weak fine and medium subangular blocky structure parting to weak fine granular; slightly hard, very friable; few very fine roots throughout; few very fine tubular pores; neutral; abrupt smooth boundary.
- E—8 to 10 inches; gray (10YR 5/1) very fine sandy loam, very dark gray (10YR 3/1) moist; weak thin platy structure; soft, very friable; few very fine roots throughout; few very fine tubular pores; neutral; abrupt wavy boundary.
- Bt_n1—10 to 14 inches; dark gray (10YR 4/1) silty clay loam, black (10YR 2/1) moist; moderate medium and coarse columnar structure parting to moderate medium and coarse subangular blocky; hard, firm, sticky and plastic; few very fine roots between peds; few very fine tubular pores; gray (10YR 5/1) coats on tops of columns and clay films on vertical faces of peds; moderately alkaline; clear wavy boundary.
- Bt_n2—14 to 24 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark brown (10YR 2/2) moist; moderate medium and coarse prismatic structure parting to moderate medium and coarse subangular blocky; hard, firm, sticky and plastic; few very fine roots between peds; common very fine tubular pores; clay films on vertical faces of peds; moderately alkaline; clear wavy boundary.
- Bk_z—24 to 38 inches; light gray (2.5Y 7/2) silt loam, light olive brown (2.5Y 5/3) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; hard, friable, slightly sticky and slightly plastic; common very

- fine tubular pores; 25 percent calcium carbonate equivalent; common fine salt masses; few fine prominent dark yellowish brown (10YR 4/4) redox concentrations; violently effervescent; strongly alkaline; gradual wavy boundary.
- C1—38 to 55 inches; pale yellow (2.5Y 7/3) very fine sandy loam, light olive brown (2.5Y 5/3) moist; massive; soft, very friable; few very fine tubular pores; 13 percent calcium carbonate equivalent; few fine prominent dark yellowish brown (10YR 4/4) redox concentrations and few fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; strongly alkaline; gradual wavy boundary.
- C2—55 to 80 inches; pale yellow (2.5Y 7/3) very fine sandy loam, light olive brown (2.5Y 5/3) moist; massive; soft, very friable; few very fine tubular pores; 10 percent calcium carbonate equivalent; common fine and medium prominent dark yellowish brown (10YR 4/4) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; strongly effervescent; strongly alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 to 30 inches

Depth to carbonates: 18 to 35 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: 16 to 30 inches

Remarks: Some pedons have a Btnkz horizon.

A horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 1

Texture - very fine sandy loam or loam but is fine sandy loam in some pedons

E horizon:

Hue - 10YR; value - 5 to 7 (3 to 5 moist); and chroma - 1 or 2

Texture - very fine sandy loam, loam, or fine sandy loam

Btn horizon:

Hue - 10YR or 2.5Y; value - 4 to 6 (2 to 4 moist); and chroma - 1 to 3

Texture - loam, clay loam, silty clay loam, or silt loam

Bkz horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 1 to 3

Texture - loam, clay loam, silt loam, or fine sandy loam

C horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - very fine sandy loam, loam, silt loam, or fine sandy loam

Vallers Series

Depth to restrictive feature: None

Drainage class: Poorly drained

Permeability: Moderately slow

Landform: Till plains

Parent material: Loamy glacial till

Slope: 0 to 2 percent

Typical Pedon

Vallers loam, in an area of Vallers-Hamerly loams, 0 to 2 percent slopes, 850 feet west and 300 feet north of the southeast corner of sec. 22, T. 116 N., R. 63 W.; USGS Frankfort SW, SD topographic quadrangle; lat. 44 degrees 50 minutes 10 seconds N. and long. 98 degrees 23 minutes 2 seconds W.

- A—0 to 6 inches; very dark gray (10YR 3/1) loam, black (10YR 2/1) moist; weak fine subangular blocky structure parting to weak fine granular; slightly hard, friable; many very fine and fine roots throughout; few very fine tubular pores; 8 percent calcium carbonate equivalent; strongly effervescent; slightly alkaline; clear smooth boundary.
- ABk—6 to 13 inches; dark gray (2.5Y 4/1) loam, very dark gray (2.5Y 3/1) moist; weak fine subangular blocky structure; slightly hard, friable; common very fine and fine roots throughout; few very fine tubular pores; 20 percent calcium carbonate equivalent; violently effervescent; moderately alkaline; clear smooth boundary.
- Bkg—13 to 22 inches; gray (5Y 6/1) loam, dark gray (5Y 4/1) moist; weak fine and medium subangular blocky structure; slightly hard, friable; common very fine roots throughout; few very fine tubular pores; 30 percent calcium carbonate equivalent; few fine prominent dark yellowish brown (10YR 4/4) redox concentrations; violently effervescent; moderately alkaline; clear smooth boundary.
- BCkg—22 to 30 inches; light olive gray (5Y 6/2) clay loam, olive gray (5Y 4/2) moist; weak fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine tubular pores; 20 percent calcium carbonate equivalent; common fine soft masses of carbonate and few fine gypsum crystals; common fine prominent dark yellowish brown (10YR 4/4) redox concentrations; 2 percent pebbles; violently effervescent; moderately alkaline; gradual wavy boundary.
- Cg1—30 to 47 inches; light olive gray (5Y 6/2) clay loam, olive gray (5Y 4/2) moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine roots throughout; common very fine tubular pores; 12 percent calcium carbonate equivalent; common fine and medium iron concretions and common fine soft masses of iron-manganese; common fine and medium prominent dark yellowish brown (10YR 4/4) redox concentrations and common fine distinct gray (2.5Y 5/1) redox depletions; 3 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
- Cg2—47 to 80 inches; light olive gray (5Y 6/2) clay loam, olive gray (5Y 4/2) moist; massive; hard, firm, slightly sticky and slightly plastic; common very fine tubular pores; 13 percent calcium carbonate equivalent; few fine iron concretions and common fine soft masses of iron-manganese; many fine and medium prominent dark yellowish brown (10YR 4/4) redox concentrations and common fine distinct gray (2.5Y 5/1) redox depletions; 3 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 25 inches

Depth to carbonates: 0 to 6 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 20 inches

Remarks: Some pedons lack a ABk or BCkg horizon

A horizon:

Hue - 10YR, 2.5Y, 5Y, or neutral; value - 3 or 4 (2 or 3 moist); and chroma - 0 or 1

Texture - loam but is clay loam in some pedons

Bkg horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 4 to 7 (3 to 6 moist); and chroma - 1 or 2

Texture - loam or clay loam

Cg horizon:

Hue - 2.5Y or 5Y; value - 5 to 8 (4 to 7 moist); and chroma - 1 to 3
Texture - loam or clay loam

Vang Series

Depth to restrictive feature: Strongly contrasting textural stratification; top depth ranges from 20 to 40 inches

Drainage class: Well drained

Permeability: Moderate in the loamy sediments and rapid in the underlying shaley gravelly material

Landform: Outwash plains

Parent material: Loamy alluvium over glacial outwash

Slope: 0 to 2 percent

Typical Pedon

Vang loam, 0 to 2 percent slopes, 475 feet north and 800 feet west of the southeast corner of sec. 28, T. 117 N., R. 61 W.; USGS Doland NW, SD topographic quadrangle; lat. 44 degrees 54 minutes 32 seconds N. and long. 98 degrees 10 minutes 10 seconds W.

A—0 to 9 inches; very dark gray (10YR 3/1) loam, black (10YR 2/1) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots throughout; few very fine tubular pores; neutral; clear smooth boundary.

Bw1—9 to 17 inches; dark gray (10YR 4/1) clay loam, black (10YR 2/1) moist; weak medium prismatic structure parting to moderate fine subangular blocky; slightly hard, friable, sticky and plastic; common very fine and fine roots throughout; common very fine tubular pores; moderately alkaline; clear smooth boundary.

Bw2—17 to 23 inches; dark grayish brown (2.5Y 4/2) clay loam, very dark grayish brown (2.5Y 3/2) moist; weak medium prismatic structure parting to moderate fine subangular blocky; slightly hard, friable, sticky and plastic; few very fine roots throughout; common very fine tubular pores; moderately alkaline; clear smooth boundary.

Bk—23 to 29 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, sticky and plastic; few very fine roots throughout; common very fine tubular pores; 14 percent calcium carbonate equivalent; common fine and medium soft masses of carbonate; strongly effervescent; 3 percent gravel; moderately alkaline; gradual wavy boundary.

2C—29 to 80 inches; light brownish gray (2.5Y 6/2) very gravelly coarse sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose; 25 percent shale fragments; 9 percent calcium carbonate equivalent; common manganese or iron-manganese stains on sand and gravel and few carbonate coats on sand and gravel; common medium and coarse iron-manganese concretions; slightly effervescent; 40 percent gravel; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 16 to 33 inches

Depth to carbonates: 14 to 40 inches

Depth to contrasting parent material: 20 to 40 inches over shaley gravelly material

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1
Texture - loam but is clay loam in some pedons

Bw and Bk horizon:

Hue - 10YR or 2.5Y; value - 4 to 6 (2 to 4 moist); and chroma - 1 to 3
Texture - loam or clay loam

2C horizon:

Hue - 2.5Y or 5Y; value - 5 to 7 (2 to 6 moist); and chroma - 1 to 4
Texture - gravelly sand, very gravelly sand, gravelly coarse sand, or very gravelly coarse sand

Vida Series

Depth to restrictive feature: None

Drainage class: Well drained

Permeability: Moderately slow

Landform: Moraines

Parent material: Glacial till

Slope: 9 to 15 percent

Typical Pedon

Vida loam, in an area of Williams-Vida loams, 6 to 15 percent slopes, 1,750 feet west and 350 feet south of the northeast corner of sec. 7, T. 120 N., R. 65 W.; USGS Chelsea, SD topographic quadrangle; lat. 45 degrees 13 minutes 45 seconds N. and long. 98 degrees 42 minutes 16 seconds W.

- A—0 to 3 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; slightly hard, friable; many fine and medium roots throughout; few very fine tubular pores; slightly acid; clear smooth boundary.
- Bt—3 to 9 inches; brown (10YR 4/3) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common fine and medium roots throughout; few very fine tubular pores; clay films on vertical faces of peds; neutral; clear smooth boundary.
- Bk—9 to 21 inches; light yellowish brown (2.5Y 6/3) clay loam, light olive brown (2.5Y 5/3) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; common very fine and fine tubular pores; 15 percent calcium carbonate equivalent; common fine and medium soft masses of carbonate; strongly effervescent; 1 percent pebbles; slightly alkaline; gradual wavy boundary.
- C1—21 to 45 inches; pale yellow (2.5Y 7/3) clay loam, light olive brown (2.5Y 5/3) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; few very fine tubular pores; 11 percent calcium carbonate equivalent; few fine faint dark yellowish brown (10YR 4/4) relict redox features; 3 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C2—45 to 80 inches; light yellowish brown (2.5Y 6/3) clay loam, light olive brown (2.5Y 5/3) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; 11 percent calcium carbonate equivalent; few fine distinct gray (10YR 5/1) and common fine prominent dark yellowish brown (10YR 4/6) relict redox features; 3 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 10 inches

Depth to carbonates: 6 to 10 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

Remarks: Some pedons lack a C horizon.

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 2 or 3

Texture - loam but is clay loam in some pedons

Bt horizon:

Hue - 10YR; value - 4 or 5 (3 or 4 moist); and chroma - 2 or 3

Texture - loam or clay loam

Bk or C horizon:

Hue - 10YR or 2.5Y; value - 6 or 7 (5 or 6 moist); and chroma - 2 or 3

Texture - loam or clay loam

Whitelake Series

Depth to restrictive feature: Natric-top depth ranges from 9 to 20 inches

Drainage class: Moderately well drained

Permeability: Slow in the solum and moderate or moderately rapid in the underlying material

Landform: Outwash plains

Parent material: Loamy glaciofluvial sediments

Slope: 0 to 2 percent

Typical Pedon

Whitelake fine sandy loam, in an area of Woonsocket-Whitelake fine sandy loams, 0 to 2 percent slopes, 800 feet south and 1,900 feet west of the northeast corner of sec. 27, T. 114 N., R. 61 W.; USGS Lake Byron NW, SD topographic quadrangle; lat. 44 degrees 39 minutes 30 seconds N. and long. 98 degrees 8 minutes 50 seconds W.

A—0 to 8 inches; dark gray (10YR 4/1) fine sandy loam, black (10YR 2/1) moist; weak fine granular structure; soft, very friable; many very fine and fine roots throughout; common very fine tubular pores; neutral; clear smooth boundary.

E—8 to 12 inches; light brownish gray (10YR 6/2) loamy fine sand, dark grayish brown (10YR 4/2) moist; weak fine granular structure; soft, very friable; common very fine roots throughout; common very fine tubular pores; neutral; abrupt smooth boundary.

Btn1—12 to 15 inches; grayish brown (10YR 5/2) sandy clay loam, very dark grayish brown (10YR 3/2) moist; strong very coarse columnar structure parting to moderate medium prismatic; very hard, firm, sticky and plastic; common very fine roots throughout; few very fine tubular pores; light brownish gray (10YR 6/2) coats on tops of columns and clay films on vertical faces of peds; neutral; clear smooth boundary.

Btn2—15 to 21 inches; grayish brown (10YR 5/2) sandy clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; very hard, firm, sticky and plastic; common very fine roots throughout; few very fine tubular pores; clay films on vertical faces of peds; neutral; clear wavy boundary.

- Bk**—21 to 35 inches; light olive brown (2.5Y 5/3) sandy loam, olive brown (2.5Y 4/3) moist; weak fine and medium subangular blocky structure; slightly hard, very friable; few very fine roots throughout; common very fine tubular pores; 9 percent calcium carbonate equivalent; common fine soft masses of carbonate; few fine distinct dark yellowish brown (10YR 4/4) redox concentrations; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C1**—35 to 64 inches; light olive brown (2.5Y 5/3) sandy loam, olive brown (2.5Y 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; 6 percent calcium carbonate equivalent; few fine soft masses of carbonate and few fine soft masses of iron-manganese; common fine distinct dark yellowish brown (10YR 4/4) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; 1 percent gravel; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C2**—64 to 80 inches; light yellowish brown (2.5Y 6/3) sandy loam, olive brown (2.5Y 4/3) moist; massive; slightly hard, friable; few very fine tubular pores; 5 percent calcium carbonate equivalent; common fine distinct dark yellowish brown (10YR 4/4) redox concentrations and common fine prominent gray (10YR 5/1) redox depletions; 2 percent gravel; strongly effervescent; slightly alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 30 inches

Depth to carbonates: 10 to 35 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

Remarks: Some pedons have a Btnk or BC horizon. Some pedons lack a Bk horizon.

A horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 1 to 3

Texture - fine sandy loam but is sandy loam in some pedons

E horizon:

Hue - 10YR; value - 5 or 6 (3 or 4 moist); and chroma - 1 or 2

Texture - loamy fine sand, fine sandy loam, or sandy loam

Btn horizon:

Hue - 10YR; value - 5 or 6 (3 to 5 moist); and chroma - 2 or 3

Texture - sandy clay loam or fine sandy loam

Bk horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - fine sandy loam, sandy clay loam, sandy loam, loamy fine sand, or loamy sand

C horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - stratified loamy sand, sand, sandy loam, fine sandy loam, sandy clay loam, silt loam, or loam

Williams Series

Depth to restrictive feature: None

Drainage class: Well drained

Permeability: Moderately slow

Landform: Till plains and moraines

Parent material: Loamy glacial till

Slope: 0 to 9 percent

Typical Pedon

Williams loam, in an area of Williams-Zahl-Bowbells loams, 1 to 6 percent slopes, 2,600 feet west and 900 feet south of the northeast corner of sec. 5, T. 120 N., R. 65 W.; USGS Chelsea, SD topographic quadrangle; lat. 45 degrees 14 minutes 27 seconds N. and long. 98 degrees 41 minutes 14 seconds W.

- A—0 to 7 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak fine granular structure; slightly hard, friable; many very fine and fine roots throughout; common very fine tubular pores; neutral; clear smooth boundary.
- Bt1—7 to 15 inches; brown (10YR 5/3) clay loam, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, friable, slightly sticky and slightly plastic; common very fine and fine roots throughout; few very fine tubular pores; clay films on vertical faces of peds; neutral; clear wavy boundary.
- Bt2—15 to 22 inches; light olive brown (2.5Y 5/3) clay loam, olive brown (2.5Y 4/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, friable, slightly sticky and slightly plastic; common very fine and fine roots throughout; few very fine tubular pores; clay films on vertical faces of peds; neutral; clear wavy boundary.
- Bk1—22 to 34 inches; light yellowish brown (2.5Y 6/3) clay loam, light olive brown (2.5Y 5/3) moist; weak medium and coarse subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine tubular pores; 16 percent calcium carbonate equivalent; many fine soft masses of carbonate; strongly effervescent; 2 percent pebbles; moderately alkaline; clear wavy boundary.
- Bk2—34 to 47 inches; light yellowish brown (2.5Y 6/3) clay loam, light olive brown (2.5Y 5/3) moist; weak fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine tubular pores; 12 percent calcium carbonate equivalent; common fine soft masses of carbonate; few fine distinct dark yellowish brown (10YR 4/4) relict redox features; 2 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C1—47 to 65 inches; light yellowish brown (2.5Y 6/4) clay loam, light olive brown (2.5Y 5/4) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; 10 percent calcium carbonate equivalent; few fine soft masses of carbonate; few fine soft masses of iron-manganese; common fine distinct dark yellowish brown (10YR 4/4) relict redox features; 2 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C2—65 to 80 inches; light yellowish brown (2.5Y 6/4) clay loam, light olive brown (2.5Y 5/4) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; 10 percent calcium carbonate equivalent; few fine soft masses of carbonate and few fine gypsum crystals; few fine soft masses of iron-manganese; common fine distinct dark yellowish brown (10YR 4/4) redox concentrations and few fine prominent gray (10YR 5/1) redox depletions; 2 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 16 inches

Depth to carbonates: 10 to 30 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

Remarks: Some pedons have a Btk horizon.

A horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 2
Texture - loam but is clay loam in some pedons

Bt horizon:

Hue - 10YR or 2.5Y; value - 4 to 6 (2 to 5 moist); and chroma - 2 to 4
Texture - loam or clay loam

Bk horizon:

Hue - 10YR 2.5Y, or 5Y; value - 4 to 8 (3 to 6 moist); and chroma - 2 to 4
Texture - loam or clay loam

C horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 5 to 8 (3 to 6 moist); and chroma - 2 to 4
Texture - loam or clay loam

Winship Series

Depth to restrictive feature: None

Drainage class: Somewhat poorly drained

Permeability: Moderately slow

Landform: Lake plains

Parent material: Silty glaciolacustrine sediments over loamy glacial till

Slope: 0 to 1 percent

Typical Pedon

Winship silt loam, in an area of Beotia-Winship silt loams, 0 to 2 percent slopes, 320 feet south and 2,100 feet west of the northeast corner of sec. 16, T. 117 N., R. 62 W.; USGS Frankfort, SD topographic quadrangle; lat. 44 degrees 57 minutes 5 seconds N. and long. 98 degrees 17 minutes 44 seconds W.

Ap—0 to 8 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; weak fine granular structure; slightly hard, friable; few very fine roots throughout; common very fine and fine tubular pores; slightly alkaline; abrupt smooth boundary.

A1—8 to 19 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; weak fine subangular blocky structure parting to weak fine granular; slightly hard, friable; few very fine roots throughout; common very fine and fine tubular pores; slightly alkaline; gradual wavy boundary.

A2—19 to 25 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; weak fine subangular blocky structure; slightly hard, friable; few very fine roots throughout; common very fine and fine tubular pores; slightly alkaline; clear wavy boundary.

BA—25 to 34 inches; gray (10YR 5/1) silt loam, black (10YR 2/1) moist; moderate fine and medium subangular blocky structure; hard, friable; few very fine roots throughout; common very fine and fine tubular pores; gray (10YR 6/1) coats on faces of pedis; slightly alkaline; clear smooth boundary.

Bt1—34 to 44 inches; dark gray (10YR 4/1) silty clay loam, very dark gray (10YR 3/1) moist; moderate medium prismatic structure parting to moderate fine and medium angular blocky; hard, firm, sticky and plastic; few very fine roots throughout; few very fine tubular pores; clay films on vertical faces of pedis; slightly alkaline; clear wavy boundary.

Bt2—44 to 57 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate fine and medium angular blocky; hard, firm, sticky and plastic; few very fine roots throughout; few very fine tubular pores; clay films on vertical faces of pedis; slightly alkaline; clear wavy boundary.

BC—57 to 72 inches; light brownish gray (2.5Y 6/2) silty clay loam, grayish brown (2.5Y 5/2) moist; weak fine and medium subangular blocky structure; hard, firm, sticky and plastic; common very fine tubular pores; 7 percent calcium carbonate equivalent; few fine prominent dark yellowish brown (10YR 4/6) redox concentrations; slightly effervescent; slightly alkaline; gradual wavy boundary.

Cg—72 to 80 inches; pale yellow (5Y 7/3) silt loam, olive (5Y 5/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine tubular pores; varved with very fine sand to clay; 11 percent calcium carbonate equivalent; many fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations; strongly effervescent; slightly alkaline.

Range in Characteristics

Mollic epipedon thickness: Greater than 32 inches

Depth to carbonates: Greater than 40 inches

Depth to contrasting parent material: Greater than 40 inches over glacial till

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

Remarks: Some pedons have a loam or clay loam 2C horizon.

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1

Texture - silt loam but is silty clay loam in some pedons

BA horizon:

Hue - 10YR; value - 4 to 6 (2 or 3 moist); and chroma - 1 or 2

Texture - silt loam or silty clay loam

Bt horizon:

Hue - 10YR or 2.5Y; value - 4 to 6 (2 to 4 moist); and chroma - 1 or 2

Texture - silty clay loam

BC or Bk horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 6 or 7 (5 or 6 moist); and chroma - 2 or 3

Texture - silt loam or silty clay loam

C horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 or 3

Texture - silt loam or silty clay loam and typically is varved with very fine sand to clay in the lower part

2C horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 or 3

Texture - clay loam or loam

Woonsocket Series

Depth to restrictive feature: None

Drainage class: Moderately well drained

Permeability: Moderately slow in the solum and moderately rapid or rapid in the underlying material

Landform: Outwash plains

Parent material: Loamy glaciofluvial sediments

Slope: 0 to 2 percent

Typical Pedon

Woonsocket fine sandy loam, in an area of Woonsocket-Whitelake fine sandy loams, 0 to 2 percent slopes, 1,750 feet west and 1,880 feet south of the northeast corner of sec. 34, T. 115 N., R. 65 W.; lat. 44 degrees 43 minutes 47 seconds N. and long. 98 degrees 37 minutes 54 seconds W.

- A—0 to 7 inches; dark gray (10YR 4/1) fine sandy loam, black (10YR 2/1) moist; weak fine granular structure; soft, very friable; many very fine and fine roots throughout; few very fine tubular pores; slightly acid; clear smooth boundary.
- BE—7 to 9 inches; dark grayish brown (10YR 4/2) and grayish brown (10YR 5/2) fine sandy loam, very dark brown (10YR 2/2) and very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure parting to weak thin platy; slightly hard, friable; common very fine roots throughout; few very fine tubular pores; neutral; clear smooth boundary.
- Bt_n1—9 to 15 inches; dark grayish brown (10YR 4/2) sandy clay loam, very dark brown (10YR 2/2) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; very hard, firm, slightly sticky and slightly plastic; few very fine roots between peds; few very fine tubular pores; dark gray (10YR 4/1) coats on vertical faces of peds and clay films on vertical faces of peds; neutral; clear smooth boundary.
- Bt_n2—15 to 25 inches; grayish brown (10YR 5/2) sandy clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium and coarse prismatic structure parting to weak fine and medium subangular blocky; very hard, firm, slightly sticky and slightly plastic; few very fine roots between peds; few very fine tubular pores; clay films on vertical faces of peds; neutral; clear smooth boundary.
- Bk—25 to 37 inches; light brownish gray (2.5Y 6/2) fine sandy loam, grayish brown (2.5Y 5/2) moist; few fine prominent dark yellowish brown (10YR 4/6) redox concentrations and few fine distinct gray (10YR 5/1) redox depletions; weak fine and medium subangular blocky structure; soft, very friable; few very fine roots throughout; few very fine tubular pores; 9 percent calcium carbonate equivalent; common fine soft masses of carbonate; strongly effervescent; moderately alkaline; clear wavy boundary.
- C1—37 to 72 inches; pale yellow (2.5Y 7/3) fine sandy loam, light olive brown (2.5Y 5/3) moist; common fine prominent dark yellowish brown (10YR 4/6) redox concentrations and few fine distinct gray (10YR 5/1) redox depletions; massive; soft, very friable; few very fine tubular pores; 5 percent calcium carbonate equivalent; few fine soft masses of carbonate; strongly effervescent; moderately alkaline; gradual wavy boundary.
- C2—72 to 80 inches; pale yellow (2.5Y 7/3) fine sandy loam, light olive brown (2.5Y 5/3) moist; common fine and medium prominent dark yellowish brown (10YR 4/6) redox concentrations and common fine distinct gray (10YR 5/1) redox depletions; massive; soft, very friable; few very fine tubular pores; 6 percent calcium carbonate equivalent; few fine soft masses of carbonate; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 20 to 35 inches

Depth to carbonates: 14 to 35 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR; value - 3 or 4 (2 or 3 moist); and chroma - 1 or 2
Texture - fine sandy loam but is sandy loam in some pedons

BE horizon:

Hue - 10YR; value - 3 to 5 (2 to 4 moist); and chroma - 1 or 2
Texture - fine sandy loam or sandy loam

Btn horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 1 or 2
Texture - sandy clay loam but is sandy loam or fine sandy loam in some pedons

Bk or C horizon:

Hue - 10YR or 2.5Y; value - 5 to 7 (3 to 5 moist); and chroma - 2 to 4
Texture - fine sandy loam, loamy sand, loamy fine sand, or fine sand

Worthing Series

Depth to restrictive feature: None

Drainage class: Very poorly drained

Permeability: Slow

Landform: Till plains

Parent material: Local clayey alluvium

Slope: 0 to 1 percent

Typical Pedon

Worthing silty clay loam, 0 to 1 percent slopes, 900 feet east and 145 feet north of the southwest corner of sec. 19, T. 109 N., R. 55 W., Kingsbury County; USGS Oldham NW, SD topographic quadrangle; lat. 44 degrees 13 minutes 28 seconds N. and long. 97 degrees 29 minutes 15 seconds W.

A—0 to 10 inches; dark gray (10YR 4/1) silty clay loam, black (10YR 2/1) moist; weak fine and medium subangular blocky structure parting to weak medium granular; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots throughout; common very fine and fine tubular pores; neutral; clear wavy boundary.

Bt1—10 to 17 inches; dark gray (10YR 4/1) silty clay, black (10YR 2/1) moist; moderate fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; few very fine tubular pores; clay films on vertical faces of peds and few organic coats on faces of peds; common medium and coarse iron-manganese concretions; neutral; gradual wavy boundary.

Bt2—17 to 32 inches; dark gray (10YR 4/1) silty clay, black (10YR 2/1) moist; weak medium prismatic structure parting to moderate fine and medium subangular blocky; very hard, firm, sticky and plastic; common very fine roots throughout; few very fine tubular pores; clay films on vertical faces of peds and few organic coats on faces of peds; common medium and coarse iron-manganese concretions; neutral; gradual wavy boundary.

Bt3—32 to 45 inches; dark gray (10YR 4/1) silty clay, black (10YR 2/1) moist; moderate fine and medium subangular blocky structure; very hard, firm, sticky and plastic; few very fine tubular pores; clay films on vertical faces of peds; neutral; gradual wavy boundary.

Bkg—45 to 60 inches; light olive gray (5Y 6/2) silty clay loam, olive gray (5Y 4/2) moist; weak medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; common very fine tubular pores; common medium soft masses of carbonate; common medium prominent strong brown (7.5YR 4/6) redox

concentrations and common fine and medium prominent gray (2.5Y 5/1) redox depletions; strongly effervescent; slightly alkaline.

Range in Characteristics

Mollic epipedon thickness: Greater than 35 inches

Depth to carbonates: Greater than 35 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 35 inches

Remarks: Some pedons have a Bg or Cg horizon.

A horizon:

Hue - 10YR, 2.5Y, 5Y, or neutral; value - 3 or 4 (2 or 3 moist); and chroma - 0 or 1

Texture - silty clay loam but is silt loam or silty clay in some pedons

Bt horizon:

Hue - 10YR, 2.5Y, 5Y, or neutral; value - 3 to 7 (2 to 5 moist); and chroma - 0 or 1

Texture - silty clay or clay

Bkg horizon:

Hue - 2.5Y, 5Y, or neutral; value - 4 to 8 (3 to 6 moist); and chroma - 0 or 2

Texture - silty clay, clay, silty clay loam, or clay loam

Zahill Series

Depth to restrictive feature: None

Drainage class: Well drained

Permeability: Moderately slow

Landform: Moraines

Parent material: Loamy glacial till

Slope: 15 to 40 percent

Typical Pedon

Zahill loam, 15 to 40 percent slopes, 20 feet west and 1,000 feet south of the northeast corner of sec. 34, T. 118 N., R. 65 W.; USGS Zell, SD topographic quadrangle; lat. 44 degrees 59 minutes 48 seconds N. and long. 98 degrees 38 minutes 8 seconds W.

A—0 to 3 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; slightly hard, friable; common very fine and fine roots throughout; common very fine and fine tubular pores; 7 percent calcium carbonate equivalent; strongly effervescent; slightly alkaline; clear smooth boundary.

Bk1—3 to 6 inches; pale yellow (2.5Y 7/3) loam, light olive brown (2.5Y 5/3) moist; moderate medium and coarse prismatic structure parting to weak medium subangular blocky; slightly hard, friable; common very fine and fine roots throughout; common very fine and fine tubular pores; 17 percent calcium carbonate equivalent; many fine and medium soft masses of carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.

Bk2—6 to 18 inches; pale yellow (2.5Y 7/3) loam, light olive brown (2.5Y 5/3) moist; weak medium and coarse prismatic structure parting to weak fine and medium subangular blocky; slightly hard, friable; common very fine roots throughout; common very fine and fine tubular pores; 18 percent calcium carbonate equivalent; common fine and medium soft masses of carbonate; strongly effervescent; 2 percent pebbles; moderately alkaline; gradual wavy boundary.

C1—18 to 30 inches; pale yellow (2.5Y 7/3) loam, light olive brown (2.5Y 5/3) moist; massive; slightly hard, friable; few very fine tubular pores; 10 percent calcium carbonate equivalent; few fine prominent dark yellowish brown (10YR 4/4) relict redox features; 2 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.

C2—30 to 80 inches; light yellowish brown (2.5Y 6/3) loam, olive brown (2.5Y 4/3) moist; massive; slightly hard, friable; few very fine tubular pores; 11 percent calcium carbonate equivalent; common fine and medium prominent dark yellowish brown (10YR 4/4) and few fine prominent gray (10YR 5/1) relict redox features; 2 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: At the surface

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 30 inches

Remarks: Some pedons have a Cy horizon.

A horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 4 to 7 (3 to 6 moist); and chroma - 2 to 4

Texture - loam but is clay loam in some pedons

Bk horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - loam or clay loam

C horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 5 to 7 (4 to 6 moist); and chroma - 2 to 4

Texture - loam or clay loam

Zahl Series

Depth to restrictive feature: None

Drainage class: Well drained

Permeability: Moderately slow

Landform: Till plains and moraines

Parent material: Loamy glacial till

Slope: 3 to 20 percent

Typical Pedon

Zahl loam, in an area of Williams-Zahl-Bowbells loams, 1 to 6 percent slopes, 2,325 feet east and 1,275 feet south of the northwest corner of sec. 5, T. 120 N., R. 65 W.; USGS Chelsea, SD topographic quadrangle; lat. 45 degrees 14 minutes 23 seconds N. and long. 98 degrees 41 minutes 17 seconds W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure parting to weak fine granular; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots throughout; common very fine tubular pores; 7 percent calcium carbonate equivalent; slightly effervescent; slightly alkaline; abrupt smooth boundary.

Bk1—8 to 19 inches; pale yellow (2.5Y 7/3) loam, light olive brown (2.5Y 5/3) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine tubular pores; 16 percent calcium carbonate equivalent; common fine soft

masses of carbonate; strongly effervescent; 3 percent pebbles; moderately alkaline; clear wavy boundary.

Bk2—19 to 29 inches; pale yellow (2.5Y 7/3) clay loam, light olive brown (2.5Y 5/3) moist; weak fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine tubular pores; 14 percent calcium carbonate equivalent; common fine soft masses of carbonate; strongly effervescent; 3 percent pebbles; moderately alkaline; clear wavy boundary.

C1—29 to 56 inches; pale yellow (2.5Y 7/4) clay loam, light olive brown (2.5Y 5/4) moist; massive; hard, friable, slightly sticky and slightly plastic; common very fine tubular pores; 11 percent calcium carbonate equivalent; few fine soft masses of carbonate; common fine distinct yellowish brown (10YR 5/6) relict redox features; 3 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.

C2—56 to 80 inches; pale yellow (2.5Y 7/4) clay loam, light olive brown (2.5Y 5/4) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; 12 percent calcium carbonate equivalent; few fine soft masses of carbonate; common fine distinct yellowish brown (10YR 5/6) and few fine prominent gray (10YR 6/1) relict redox features; 3 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 8 inches

Depth to carbonates: 0 to 3 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 60 inches

A horizon:

Hue - 10YR or 2.5Y; value - 3 to 5 (2 or 3 moist); and chroma - 1 or 2

Texture - loam but is clay loam in some pedons

Bk horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 5 to 8 (3 to 7 moist); and chroma - 2 to 4

Texture - loam or clay loam

C horizon:

Hue - 10YR, 2.5Y, or 5Y; value - 5 to 8 (4 to 6 moist); and chroma - 2 to 4

Texture - loam or clay loam

Zell Series

Depth to restrictive feature: None

Drainage class: Well drained

Permeability: Moderate in the solum and moderate to slow in the underlying material

Landform: Lake plains

Parent material: Silty glaciolacustrine sediments

Slope: 2 to 25 percent

Typical Pedon

Zell silt loam (fig. 30), in an area of Great Bend-Zell silt loams, 2 to 6 percent slopes, 630 feet south and 1,575 feet west of the northeast corner of sec. 19, T. 116 N., R. 62 W.; USGS Glendale Colony, SD topographic quadrangle; lat. 44 degrees 51 minutes 48 seconds N. and long. 98 degrees 19 minutes 42 seconds W.

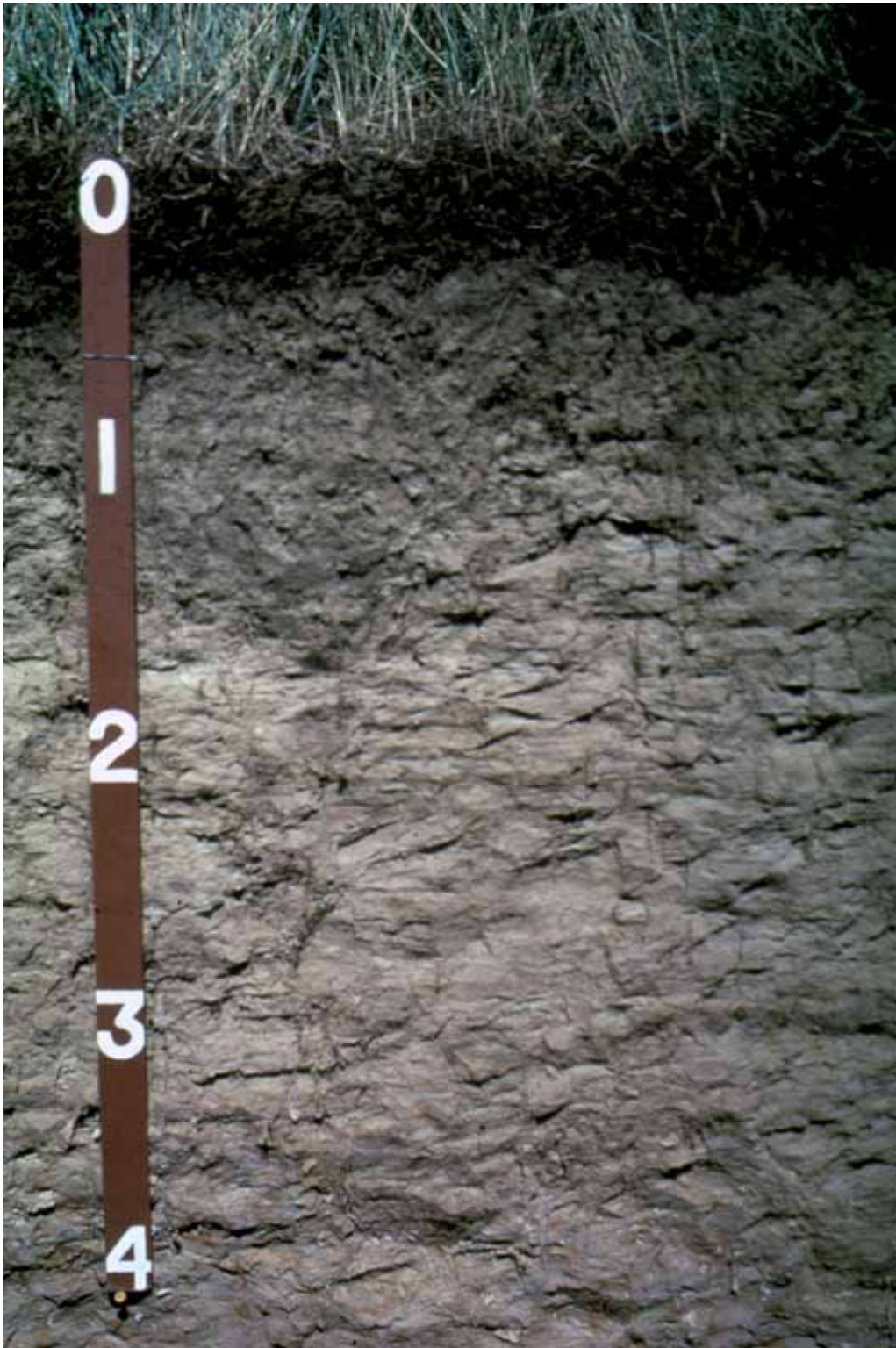


Figure 30. Profile of Zell silt loam. Calcium carbonate is at a depth of about 5 inches. Depth is marked in feet.

- Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, very dark brown (10YR 2/2) moist; weak fine and medium granular structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots throughout; few very fine tubular pores; 3 percent calcium carbonate equivalent; slightly effervescent; moderately alkaline; abrupt smooth boundary.
- Bk1—7 to 17 inches; pale yellow (2.5Y 7/3) silt loam, light olive brown (2.5Y 5/3) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine tubular pores; 27 percent calcium carbonate equivalent; violently effervescent; moderately alkaline; clear wavy boundary.
- Bk2—17 to 31 inches; pale yellow (2.5Y 7/4) silt loam, light olive brown (2.5Y 5/4) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots throughout; common very fine tubular pores; 24 percent calcium carbonate equivalent; violently effervescent; moderately alkaline; gradual wavy boundary.
- C1—31 to 49 inches; pale yellow (2.5Y 8/4) silt loam, light yellowish brown (2.5Y 6/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; varved with very fine sand to clay; 21 percent calcium carbonate equivalent; strongly effervescent; strongly alkaline; gradual wavy boundary.
- C2—49 to 80 inches; pale yellow (2.5Y 8/4) silt loam, light yellowish brown (2.5Y 6/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine tubular pores; varved with very fine sand to clay; 17 percent calcium carbonate equivalent; common fine prominent gray (10YR 5/1) and common fine prominent dark yellowish brown (10YR 4/6) relict redox features; strongly effervescent; strongly alkaline.

Range in Characteristics

Mollic epipedon thickness: 7 to 10 inches

Depth to carbonates: 0 to 4 inches

Depth to contrasting parent material: Greater than 60 inches

Depth to gypsum and other visible salts other than carbonates: Greater than 20 inches

Remarks: Some pedons have a Bky horizon.

A horizon:

Hue - 10YR; value - 3 to 5 (2 or 3 moist); and chroma - 1 or 2

Texture - silt loam or very fine sandy loam

Bk horizon:

Hue - 10YR or 2.5Y; value - 5 to 8 (3 to 6 moist); and chroma - 2 to 4

Texture - silt loam or very fine sandy loam

C horizon:

Hue - 10YR or 2.5Y; value - 6 to 8 (4 to 6 moist); and chroma - 2 to 4

Texture - silt loam or very fine sandy loam and typically is varved with very fine sand to clay in the lower part

Formation of the Soils

Soil forms when chemical and physical processes act on geologically deposited or accumulated material. The characteristics of the soil at any given point are determined by the physical and mineralogical composition of the parent material, the climate under which the soil material has accumulated and existed since accumulation, the plant and animal life on and in the soil, the relief, and the length of time that the forces of soil formation have acted on the soil material.

Climate and plant and animal life, chiefly plants, are active factors of soil formation. They act on the parent material and slowly change it to a natural body that has genetically related horizons. The effects of climate and plant and animal life are conditioned by relief. The parent material affects the kind of soil profile that forms and, in extreme cases, determines it almost entirely. Finally, time is needed for changing the parent material into a soil having genetically related horizons. Usually, a long time is required for development of distinct horizons.

The factors of soil formation are so closely interrelated in their effects on the soil that few generalizations can be made regarding the effect of any one factor unless conditions are specified for the other four. The following paragraphs relate the factors of soil formation to the soils in Spink County.

Climate

Climate directly influences the rate of chemical and physical weathering. Spink County has a continental climate marked by cold winters and hot summers. This climate favors the growth of grasses and the resulting accumulation of organic matter in the upper part of the soil. The precipitation is sufficient to leach carbonates in most soils to an average depth of about 16 to 18 inches. The climate in the eastern part of the county is somewhat wetter than in the western part and the climate in the northern part of the county is somewhat cooler than in the southern part, thus the climate areas become factors in differentiating some of the soils within the county.

Spink County is divided into three Major Land Resource Areas (MLRAs) - 53B, 55B, and 55C (See Index to Map Sheets). MLRAs identify nearly homogeneous areas of land use, topography, climate, water resources, potential natural vegetation, and soils.

MLRA 55B - About 70 percent of this MLRA is cropland that is dry-farmed. Corn, soybeans, small grains, and alfalfa are the principal crops grown. About 25 percent of the area, consisting of mostly sodium-affected and steeper soils, is in native range and tame pasture. Most of the area is nearly level glacial lake plain and with nearly level to undulating till on the east side. Most of the soils are Udolls. They have a moist soil moisture regime and in MLRA 55B have a cool soil temperature regime.

MLRA 55C - Nearly all this area is in farms and ranches, about 71 percent is cropland that is dry-farmed. Corn, soybeans, small grains, and alfalfa are the principal crops grown. About 25 percent of the area, consisting of the steeper soils, is in native range and tame pasture.

Most of the area is nearly level to undulating till plains with basins and moraines. Steep slopes are adjacent to the major streams. Most of the soils are Ustolls. They have a dry soil moisture regime and in MLRA 55C have a warm soil temperature regime.

MLRA 53B - Most of this area is in farms and ranches, about 66 percent is cropland that is dry-farmed. Spring wheat is the chief crop, but corn, soybeans, barley, and alfalfa are grown on many farms. The poorer natric soils and steeper soils are in native range and tame pasture.

Most of the soils are Ustolls. In MLRA 53B they have a dry soil moisture regime and cool soil temperature regime.

Soil moisture regimes are defined in terms of the level of ground water held at a tension of less than 15 bars in the moisture control section. It is assumed in the definitions that the soil supports whatever vegetation it is capable of supporting, i.e., crops, grass, or native vegetation, and that the amount of stored moisture is not being increased by irrigation or fallowing. These cultural practices affect the soil moisture conditions as long as they are continued.

Udic (moist) soil moisture regime - The udic moisture regime is one in which the soil moisture control section is not dry in any part for as long as 90 cumulative days in normal years. If the mean annual soil temperature is lower than 22 degrees C and if the mean winter and summer soil temperatures at a depth of 50 cm from the soil surface differ by 6 degrees C or more, the soil moisture control section, in normal years, is dry in all parts for less than 45 consecutive days in the 4 months following the summer solstice.

The udic soil moisture regime is common to the soils of humid climates that have well distributed rainfall; have enough rain in summer so that the amount of stored moisture plus rainfall is approximately equal to, or exceeds, the amount of evapotranspiration; or have adequate winter rains to recharge the soils; or cool, foggy summers, as in coastal areas. Water moves downward through the soils at some time in normal years.

Ustic (dry) soil moisture regime - Moisture is limited but is present at a time when conditions are suitable for plant growth.

If the mean annual soil temperature is 22 degrees C or higher or if the mean summer and winter soil temperatures differ by less than 6 degrees C at a depth of 50 cm below the soil surface, the soil moisture control section in areas of the ustic moisture regime is dry in some or all parts for 90 or more cumulative days in normal years. It is moist, however, in some part either for more than 180 cumulative days per year or for 90 or more consecutive days.

If the mean annual soil temperature is lower than 22 degrees C and if the mean summer and winter soil temperatures differ by 6 degrees C or more at a depth of 50 cm from the soil surface, the soil moisture control section in areas of the ustic moisture regime is dry in some or all parts for 90 or more cumulative days in normal years, but it is not dry in all parts for more than half of the cumulative days when the soil temperature at a depth of 50 cm is higher than 5 degrees C. If in normal years the moisture control section is moist in all parts for 45 or more consecutive days in the 4 months following the winter solstice, the moisture control section is dry in all parts for less than 45 consecutive days in the 4 months following the summer solstice.

Soil temperature regimes. The temperature of the soil is one of its important properties. Within limits, temperature controls the possibilities for plant growth and for soil formation. Below the freezing point, there is no biotic activity, water no longer moves as a liquid, and unless there is frost heaving, time stands still for the soil. Between temperatures of 0 and 5 degrees C, root growth of most plant species and germination of most seeds are impossible. A horizon as cold as 5 degree C is a thermal restriction to the roots of most plants.

Frigid (cool) - A soil with a frigid soil temperature regime has its mean annual temperature lower than 8 degrees C and the difference between mean summer (June, July, and August) and mean winter (December, January, and February) soil temperatures is more than 6 degrees C at a depth of 50 cm from the soil surface.

Mesic (warm) - The mean annual mesic soil temperature is 8s degree C or higher but lower than 15 degree C, and the difference between mean summer and mean winter soil temperatures is more than 6 degrees C at a depth of 50 cm from the soil surface.

Additional climatic data are given under the heading "General Nature of the County."

Plant and Animal Life

Plants, animals, insects, earthworms, bacteria, and fungi have an important effect on soil formation. They cause gains in organic matter, gains or losses in plant nutrients, and changes in soil structure and porosity. In Spink County, the tall and mid prairie grasses have had more influence than other living organisms on soil formation. The presence of these grasses has resulted in a surface layer, in many of many soils, that has moderate or high organic matter content. Aastad and Beotia soils are an example.

Earthworms, insects, and burrowing animals help to keep the soil open and porous. Bacteria, actinomycetes, and fungi decompose plant residue, thus releasing nutrients that plants use as food.

Parent Material

Parent material is the unconsolidated organic and mineral material in which soil forms. It determines many of the chemical and physical characteristics of the soil, such as color, texture, reaction, and consistence. Parent materials of major occurrence in Spink County are lacustrine deposits, glacial till, alluvium, and of limited occurrence glacial outwash and loess.

Spink County is in the James River Lowland physiographic region. The central and north-central parts of the county are lacustrine material. This plain is the former bed of an extensive, but shallow, short-lived, glacial lake known as Lake Dakota. Lacustrine deposits are silt, clay, and sand sediments, which range from 4 to 84 feet in thickness and were deposited by glacial meltwaters in ancient Lake Dakota. The thickest lacustrine deposits are in the northern part of the county (greater than 50 feet). These deposits gradually get thinner further to the south. Typically, the top 30 feet of the deposit has been oxidized to a cream to tan to reddish-brown color. (Tomhave, 1997) The lacustrine sediments are usually distinctly varved. Varves consist of thin alternate layers of summer-deposited light colored silt and winter-deposited dark colored organic-rich clay. The sediments are strongly calcareous and are usually moderately saline. Aberdeen, Beotia, Exline, Great Bend, Harmony, and Nahon are typical of the silty and clayey soils formed in lacustrine sediments.

Glacial till consists of unsorted aggregates of sand, silt, and clay and some rock fragments. Glacial till is the main parent material on glacial uplands east, south, and west of the lake plain. The nearly level to hilly landscape has a poorly defined drainage pattern with many potholes and closed depressions. In places as much as 250 feet of glacial till overlies shale bedrock. Shale bedrock is near the surface along areas of the Doland Ridge. The glacial till is loam or clay loam that contains small fragments of shale and stones and rocks. Beadle, Cresbard, Forman, Hand, Max, Niobell, and Stickney soils formed in glacial till.

Alluvium consists of sediments that have been moved and deposited by water. Bon, Harriet, LaDelle, Lamoure, Ludden, and Ranslo soils formed in alluvium deposited by streams. Parnell, Tetonka, Tonka, and Worthing soils formed partly or entirely in local alluvium washed in from adjacent slopes.

Glacial outwash material consisting of sand, gravel, and loamy material is located predominantly in the southwestern part of Spink County. This material was deposited by glacial meltwater. Delmont, Enet, and Talmo soils formed in loamy material underlain by sand and gravel. Blendon and Henkin soils formed in sandy outwash sediments. Carthage, Forestburg, and Elsmere soils formed in sandy outwash sediments that are underlain by glacial till.

Loess consists of uniform silty sediments deposited by wind. The area of loess in Spink County is 1 to 6 miles wide on the east side of Lake Dakota from the Doland area north to Conde. The silty material was derived from the lacustrine sediment to the northwest. The loess cap is 1 to 5 feet thick and overlies glacial till. The Kranzburg and Brookings soils formed in this material.

Relief

Relief affects soil formation through its affect on drainage, runoff, erosion, plant cover, and soil temperature. On the more sloping soils, such as Buse, Ethan, Zahl, and Zell, much of the rainfall is lost through runoff and does not penetrate the surface. The majority of the soil surface is lost through erosion. As a result, these soils have a thin surface and are calcareous at or near the surface.

Runoff is slower on the Forman, Great Bend, Hand, Max, and other less sloping soils, and more rainfall penetrates the surface. These soils are calcareous at a greater depth than the Buse, Ethan, Zahl, and Zell soils. Also, the horizons in which organic matter accumulates are thicker.

Aastad and Bowbells soils are on footslopes that receive extra moisture in the form of runoff from adjacent soils. The layers in which organic matter accumulates are thicker than those in the Forman and Houdek soils and are calcareous to a greater depth. Also, calcium carbonate is leached to a greater depth. In low areas where drainage is impeded, the fluctuating water table favors the concentration of salts in Harriet, Playmoor, and other soils. Parnell and Tonka soils are in basins where water ponds. They have the color characteristics of poorly or very poorly drained soils.

Time

The length of time that soil material has been exposed to the other four factors of soil formation is reflected in the kinds of soil that have formed. The degree of profile development reflects the age of a soil. The oldest soils are on the parts of the landscape that have been stable for the longest time. In Spink County, these are the Beadle, Forman, Houdek, Peever, and Williams soils. The youngest soils either are those in which natural erosion removes nearly as much soil material as is formed through the weathering of parent material or are alluvial soils, which receive new material each time the area is flooded. Buse, Ethan, Zahl, and Zell soils are examples of young soils that are subject to natural erosion. Bon, LaDelle, La Prairie, and Lamoure soils are examples of young alluvial soils.

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Glossary

- Alkali (sodic) soil.** A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted (SAR is > 13).
- Aggregate, soil.** Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregate produced by tillage or logging.
- Alluvium.** Material, such as sand, silt, or clay, deposited on land by streams.
- Animal unit month (AUM).** The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.
- Aquic conditions.** Current soil wetness characterized by saturation, reduction, and redoximorphic features.
- Area reclaim (in tables).** An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.
- Argillic horizon.** A subsoil horizon characterized by an accumulation of illuvial clay.
- Association, soil.** A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.
- Atterberg limits.** The collective designation of seven so-called limits of consistency of fine-grained soils, suggested by Albert Atterberg. The current usage usually retaining only the liquid limit, the plastic limit, and plasticity index.
- Available water capacity (available moisture capacity).** The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:
- | | |
|-----------------|--------------|
| Very low | 0 to 3 |
| Low | 3 to 6 |
| Moderate | 6 to 9 |
| High | 9 to 12 |
| Very high | more than 12 |
- Backslope.** The geomorphic component that forms the steepest inclined surface and principal element of many hillsides. Back slopes in profile are commonly steep, are linear, and may or may not include cliff segments.
- Basin.** A depressed area with no surface outlet. Examples are closed depressions in a glacial till plain or lake basin.
- Bedrock.** The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.
- Blowout.** A shallow depression from which all or most of the soil material has been removed by the wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Cation-exchange capacity (CEC). The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium (Ca^{++}), potassium (K^{+}), magnesium (Mg^{++}), sodium (Na^{+}), and hydrogen (H^{+}).

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane that typically takes the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

- Conservation tillage.** A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.
- Consistence, soil.** Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."
- Contour stripcropping.** Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.
- Control section.** The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.
- Corrosion.** Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.
- Cropping system.** Growing crops according to a planned system of rotation and management practices.
- Crop residue management.** Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.
- Cutbanks cave (in tables).** The walls of excavations tend to cave in or slough.
- Decreasers.** The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.
- Deferred grazing.** Postponing grazing or resting grazing land for a prescribed period.
- Denitrification.** Reduction of nitrogen oxides (usually nitrate and nitrite) to molecular nitrogen or nitrogen oxides with a lower oxidation state of nitrogen by bacterial activity (denitrification) or by chemical reactions involving nitrogen (chemodenitrification). Nitrogen oxides are used by bacteria as terminal electron acceptors in place of oxygen in anaerobic or microaerophilic respiratory metabolism.
- Dense layer (in tables).** A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.
- Depth, soil.** The thickness of weathered soil material over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.
- Depth to rock (in tables).** Bedrock is too near the surface for the specified use.
- Diversion (or diversion terrace).** A ridge of earth generally a terrace, built to protect downslope areas by diverting runoff from its natural course.
- Drainage class (natural).** Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:
- Excessively drained.** - Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the redox features related to wetness.
 - Somewhat excessively drained.** - Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the redox features related to wetness.

Well drained. - Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of redox features.

Moderately well drained. - Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained. - Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained. - Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained. - Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erodibility. The degree or intensity of a soils state or condition of, or susceptibility to, being erodible.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Excess salts (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

Excess sodium (in tables). Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fast intake (in tables). The rapid movement of water into the soil.

- Fertility, soil.** The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.
- Flood plain.** A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.
- Footslope.** The inclined surface at the base of a hill.
- Forb.** Any herbaceous plant not a grass or a sedge.
- Frost action (in tables).** Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.
- Genesis, soil.** The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.
- Glacial drift.** Pulverized and other rock material transported by glacial ice and then deposited. Also, the sorted and unsorted material deposited by streams flowing from glaciers.
- Glacial outwash.** Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.
- Glacial till.** Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.
- Glaciofluvial deposits.** Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.
- Glaciolacustrine deposits.** Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are interbedded or laminated.
- Gleyed soil.** Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.
- Grassed waterway.** A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.
- Gravel.** Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.
- Gravelly soil material.** Material that is 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.
- Green manure crop (agronomy).** A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.
- Ground water.** Water filling all the unblocked pores of the material below the water table.
- Gully.** A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.
- High-residue crops.** Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.
- Horizon, soil.** A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon. - An organic layer of fresh and decaying plant residue.

A horizon. - The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon. - The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon. - The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon. - The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon. - Soft, consolidated bedrock beneath the soil.

R layer. - Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential.

The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to .75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin. - Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border. -Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding. - Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation. - Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle). - Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow. - Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler. - Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation. - Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding. - Water, released at high points, is allowed to flow onto an area without controlled distribution.

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Landform. Any physical, recognizable form or feature of the earth's surface having a characteristic shape and produced by natural causes.

Landscape. All the natural features, such as field, hills, forests, and water, that distinguish one part of the earth's surface.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Low strength. The soil is not strong enough to support loads.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Moraine. An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size not associated with wetness. Descriptive terms are as follows: abundance=few, common, and many; size=fine, medium, and coarse; and contrast=faint, distinct, and prominent. The size measurements are of the diameter along the greatest dimension. Fine indicates less than 5 millimeters (about 0.2 inch); medium, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and coarse, more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of three simple variables - hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Native grass. A species of grass native to the region in which it is found.

Natric horizon. A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, chlorine, molybdenum, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer (upper 10 inches of the soil) is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Pasture, tame. Grazing land that has been planted primarily with introduced or domesticated native forage species, that receive periodic renovation and/or cultural treatment, such as tillage, fertilization, mowing, weed control, and/or irrigation.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percolates slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water or air to move through the profile. The rate at which a saturated soil transmits water is accepted as a

measure of this quality. In soil physics, the rate is referred to as “saturated hydraulic conductivity,” which is defined in the “Soil Survey Manual.” In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as “permeability.” Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Potential native plant community. The stabilized community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Range condition. The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor on the basis of how much the present plant community has departed from the potential.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Range site. An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha, alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Relief. The elevations or inequalities of a land surface, considered collectively.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shoulder. Forms the uppermost inclined surface at the top of a hillslope. Transition zone from back slope to summit of an upland. Dominantly convex in profile and erosional in origin.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a change of 20 feet in 100 feet of horizontal distance. In this survey, classes for simple slopes are as follows:

Level	0 to 1 percent
Nearly level	0 to 2 percent
Very gently sloping	1 to 3 percent
Gently sloping	2 to 6 percent
Moderately sloping	6 to 9 percent
Strongly sloping	9 to 15 percent
Moderately steep	15 to 25 percent
Steep	25 to 40 percent
Very steep	40 percent and higher

Classes for complex slopes are as follows:

Level	0 to 1 percent
Nearly level	0 to 2 percent
Gently undulating	1 to 3 percent
Undulating	2 to 6 percent
Gently rolling	6 to 9 percent
Rolling	9 to 15 percent
Hilly	15 to 25 percent
Steep	25 to 40 percent
Very steep	40 percent and higher

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Sodic (alkali) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediments of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are - platy (laminated), prismatic (vertical axis of aggregates longer than horizontal), columnar (prisms with rounded tops), blocky (angular or subangular), and granular. Structureless soils are either single grained (each grain by itself, as in dune sand) or massive (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Summit. The top or highest level of an upland feature. A high interfluvial area of gentler slope that is flanked by steeper hillslopes.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, and clay. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Till plain. An extensive area of nearly level to undulating soils underlain by glacial till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, chlorine, molybdenum, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Transitional layer. A layer of soil that grades to the next layer or includes parts of adjacent layers, commonly between the surface layer and subsoil or underlying layer.

Underlying layer. The C or R horizon; that part of the soil below the subsoil, commonly the parent material.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Varve. A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Tables

Temperature and Precipitation

(Recorded in the period 1971-2000 at: Redfield 6 E, SD7052)

Month	Temperature (Degrees F.)						Precipitation (Inches)				
	avg daily max	avg daily min	avg	2 yrs in 10 will have		avg # of grow deg days*	avg	2 yrs in 10 will have		avg # of days w/.1 or more	avg total snow fall
				max temp. >than	min temp. <than			less than	more than		
January	21.1	-0.5	10.3	52	-31	0	0.36	0.09	0.62	1	5.7
February	28.6	8.0	18.3	58	-29	4	0.51	0.18	0.85	1	6.0
March	40.3	20.1	30.2	72	-14	33	1.20	0.37	1.88	3	6.2
April	57.5	32.5	45.0	87	10	207	1.93	0.78	3.02	4	2.2
May	70.2	44.4	57.3	90	24	534	2.98	1.29	4.15	6	0.0
June	79.5	54.3	66.9	98	37	795	3.17	1.70	4.46	5	0.0
July	86.1	59.4	72.7	104	42	993	3.05	1.18	4.75	5	0.0
August	84.6	56.9	70.7	103	34	942	2.45	1.15	3.77	4	0.0
September	74.3	45.8	60.0	99	25	598	1.87	0.47	3.19	3	0.0
October	60.3	33.0	46.6	89	12	249	1.65	0.45	2.58	3	0.5
November	39.8	19.3	29.5	69	-8	29	0.61	0.10	1.08	1	4.6
December	27.5	6.5	17.0	54	-26	1	0.34	0.04	0.60	1	5.5
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Yearly :	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Average	55.8	31.6	43.7	---	---	---	-----	-----	-----	---	---
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Extreme	110	-47	---	107	-33	---	-----	-----	-----	---	---
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Total	---	---	---	---	---	4386	20.13	14.36	23.96	37	30.7
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Average # of days per year with at least 1 inch of snow on the ground: 62

Freeze Dates in Spring and Fall

(Recorded in the period 1971-2000 at: Redfield 6 E, SD7052)

Probability	Temperature		
	24F or lower	28F or lower	32F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	May 6	May 16	May 25
2 year in 10 later than--	May 1	May 12	May 20
5 year in 10 later than--	April 21	May 4	May 11
First freezing temperature in fall:			
1 yr in 10 earlier than--	September 24	September 17	September 10
2 yr in 10 earlier than--	September 30	September 22	September 14
5 yr in 10 earlier than--	October 10	October 2	September 23

Growing Season

(Recorded for the period 1971-2000 at: Redfield 6 E, SD7052)

Probability	Daily Minimum Temperature		
	# days > 24F	# days > 28F	# days > 32F
9 years in 10	151	130	112
8 years in 10	157	137	119
5 years in 10	170	150	133
2 years in 10	183	162	146
1 year in 10	190	169	154

Interpretive Groups

(See "Use and Management of the Soils" section for descriptions of the sites and groups.)

Map symbol and soil name	Land capability classification	Ecological site	Conservation tree/shrub group	Forage suitability group
Aa:				
Aastad-----	IIC	Loamy Overflow	1	Overflow
Ab:				
Aastad-----	IIC	Loamy Overflow	1	Overflow
Hamerly-----	IIE	Limy Subirrigated	2KK	Subirrigated
Ad:				
Aastad-----	IIC	Loamy Overflow	1	Overflow
Tonka-----	IVw	Wet Meadow	10	Wet
Ae:				
Aberdeen-----	IIIs	Clayey	4	Clayey Subsoil
Nahon-----	IVs	Claypan	9C	Claypan
Ah:				
Aberdeen-----	IIIs	Clayey	4	Clayey Subsoil
Nahon-----	IVs	Claypan	9C	Claypan
An:				
Aberdeen-----	IIIs	Clayey	4	Clayey Subsoil
Nahon-----	IVs	Claypan	9C	Claypan
Heil-----	VIIs	Closed Depression	10	Not Suited
Ao:				
Aberdeen-----	IIIs	Clayey	4	Clayey Subsoil
Nahon-----	IVs	Claypan	9C	Claypan
Heil-----	VIIs	Closed Depression	10	Not Suited
At:				
Aquents-----	Vw	NOT ASSIGNED	10	Not Suited
BaC:				
Beadle-----	IVe	Clayey	4	Clayey Subsoil
BdA:				
Beadle-----	IIIs	Clayey	4	Clayey Subsoil
Dudley-----	IVs	Claypan	9C	Claypan
BeA:				
Beadle-----	IIIs	Clayey	4	Clayey Subsoil
Stickney-----	IIIs	Clayey	4	Clayey Subsoil
BeB:				
Beadle-----	IIIe	Clayey	4	Clayey Subsoil
Stickney-----	IIIs	Clayey	4	Clayey Subsoil
BfA:				
Beadle-----	VIIIs	Clayey	10	Not Suited
Stickney-----	VIIIs	Clayey	10	Not Suited
BfB:				
Beadle-----	VIIIs	Clayey	10	Not Suited
Stickney-----	VIIIs	Clayey	10	Not Suited
Bg:				
Bearden-----	IIE	Limy Subirrigated	2KK	Subirrigated
Bk:				
Bearden-----	IIE	Limy Subirrigated	2KK	Subirrigated
Tonka-----	IVw	Wet Meadow	10	Wet
Bo:				
Beotia-----	IIC	Loamy	1	Loam

Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Ecological site	Conservation tree/shrub group	Forage suitability group
Br:				
Beotia-----	IIc	Loamy	1	Loam
Rondell-----	IIe	Limy Subirrigated	1K	Limy Upland
Bs:				
Beotia-----	IIc	Loamy Overflow	1	Overflow
Winship-----	IIw	Loamy Overflow	2	Subirrigated
Bt:				
Beotia-----	IIc	Loamy Overflow	1	Overflow
Winship-----	IIw	Loamy Overflow	2	Subirrigated
Bu:				
Bon-----	IIc	Loamy	1	Loam
Bw:				
Bon-----	VIw	Loamy Overflow	1	Overflow
BxD:				
Buse-----	VIe	Thin Loamy	10	Limy Upland
Barnes-----	IVe	Loamy	3	Loam
ByE:				
Buse-----	VIIIs	Thin Loamy	10	Not Suited
Barnes-----	VIIIs	Loamy	10	Not Suited
BzE:				
Buse-----	VIIe	Thin Loamy	10	Not Suited
Langhei-----	VIIe	Thin Loamy	10	Not Suited
Ca:				
Camtown-----	IIIs	Clayey	4	Clayey Subsoil
Turton-----	IVs	Claypan	9C	Claypan
Cf:				
Cavour-----	IVs	Claypan	9C	Claypan
Ferney-----	VIIs	Thin Claypan	10	Not Suited
Co:				
Colvin-----	IVw	Saline Subirrigated	10	Saline
Cr:				
Cresbard-----	IIIs	Clayey	4	Clayey Subsoil
Cavour-----	IVs	Claypan	9C	Claypan
Cs:				
Cresbard-----	IIIs	Clayey	4	Clayey Subsoil
Cavour-----	IVs	Claypan	9C	Claypan
Heil-----	VIIs	Closed Depression	10	Not Suited
Ct:				
Crossplain-----	IIw	Loamy Overflow	2	Subirrigated
Tetonka-----	IVw	Wet Meadow	10	Wet
Da:				
Davis-----	IIc	Loamy Overflow	1	Overflow
Northville-----	IIIs	Clayey	4	Clayey Subsoil
Db:				
Davison-----	IIe	Limy Subirrigated	1KK	Subirrigated
Dd:				
Davison-----	IIe	Limy Subirrigated	1KK	Subirrigated
Tetonka-----	IVw	Wet Meadow	10	Wet

Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Ecological site	Conservation tree/shrub group	Forage suitability group
DeA: Delmont----- Enet-----	IVs IIIs	Shallow Gravel Loamy	6G 6G	Very Droughty Loam Droughty Loam
Dk: Dimo-----	IIIs	Loamy Overflow	2	Subirrigated
Dm: Dimo----- Grat-----	IIw IVw	Loamy Overflow Wet Meadow	2 10	Subirrigated Wet
DoA: Doland----- Embden-----	IIC IIIE	Loamy Sandy	3 1	Loam Loam
Dq: Dovecreek-----	IIC	Loamy Overflow	1	Overflow
Dr: Dovray-----	Vw	Shallow Marsh	10	Wet
Du: Dudley----- Jerauld-----	IVs VIS	Claypan Thin Claypan	9C 10	Claypan Not Suited
Dx: Durrstein-----	VIS	Saline Lowland	10	Not Suited
Ea: Eckman-----	IIe	Loamy	3	Loam
EcA: Eckman----- Gardena-----	IIe IIe	Loamy Loamy	3 1	Loam Overflow
EcB: Eckman----- Gardena-----	IIe IIe	Loamy Loamy	3 1	Loam Overflow
EdB: Eckman----- Zell-----	IIe IIIE	Loamy Thin Loamy	3 8K	Loam Limy Upland
EeB: Edgeley-----	IIe	Loamy	6D	Droughty Loam
EeC: Edgeley-----	IIIE	Loamy	6D	Droughty Loam
EeD: Edgeley-----	VIe	Loamy	10	Not Suited
EgA: Egeland----- Embden-----	IIIE IIIE	Sandy Sandy	5 1	Droughty Loam Loam
EgB: Egeland----- Embden-----	IIIE IIIE	Sandy Sandy	5 1	Droughty Loam Loam
Ek: Elsmere-----	IVe	Subirrigated	2	Subirrigated

Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Ecological site	Conservation tree/shrub group	Forage suitability group
EmE:				
Ethan-----	VIIE	Thin Upland	10	Not Suited
Betts-----	VIIE	Thin Upland	10	Not Suited
EnD:				
Ethan-----	VIe	Thin Upland	10	Limy Upland
Hand-----	IVe	Loamy	3	Loam
Er:				
Exline-----	VIIs	Thin Claypan	10	Not Suited
Aberdeen-----	IIIs	Clayey	4	Clayey Subsoil
Nahon-----	IVs	Claypan	9C	Claypan
Et:				
Exline-----	VIIs	Thin Claypan	10	Not Suited
Aberdeen-----	IIIs	Clayey	4	Clayey Subsoil
Nahon-----	IVs	Claypan	9C	Claypan
Ew:				
Exline-----	VIIs	Thin Claypan	10	Not Suited
Heil-----	VIIs	Closed Depression	10	Not Suited
Ex:				
Exline-----	VIIs	Thin Claypan	10	Not Suited
Heil-----	VIIs	Closed Depression	10	Not Suited
EyA:				
Exline-----	VIIs	Thin Claypan	10	Not Suited
Putney-----	IIe	Loamy	3	Loam
Fa:				
Farmsworth----	IVs	Claypan	9W	Claypan
Durrstein-----	VIIs	Saline Lowland	10	Not Suited
Fe:				
Ferney-----	VIIs	Thin Claypan	10	Not Suited
Heil-----	VIIs	Closed Depression	10	Not Suited
Ff:				
Forestburg----	IVe	Sandy	1	Sand
Elsmere-----	IVe	Subirrigated	2	Subirrigated
Fh:				
Forestburg----	IVe	Sandy	1	Sand
Elsmere-----	IVe	Subirrigated	2	Subirrigated
Toko-----	IVw	Wet Meadow	10	Wet
FmA:				
Forman-----	IIC	Loamy	3	Loam
Aastad-----	IIC	Loamy Overflow	1	Overflow
FmB:				
Forman-----	IIe	Loamy	3	Loam
Aastad-----	IIC	Loamy Overflow	1	Overflow
FnC:				
Forman-----	IIIe	Loamy	3	Loam
Buse-----	IVe	Thin Loamy	8K	Limy Upland
FrB:				
Forman-----	IIe	Loamy	3	Loam
Buse-----	IIIe	Thin Loamy	8K	Limy Upland
Aastad-----	IIC	Loamy Overflow	1	Overflow

Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Ecological site	Conservation tree/shrub group	Forage suitability group
FrC:				
Forman-----	IIIe	Loamy	3	Loam
Buse-----	IVe	Thin Loamy	8K	Limy Upland
Aastad-----	IIE	Loamy	1	Loam
FsA:				
Forman-----	IIC	Loamy	3	Loam
Cresbard-----	IIIs	Clayey	4	Clayey Subsoil
FsB:				
Forman-----	IIE	Loamy	3	Loam
Cresbard-----	IIIE	Clayey	4	Clayey Subsoil
FtA:				
Forman-----	IIC	Loamy	3	Loam
Cresbard-----	IIIs	Clayey	4	Clayey Subsoil
Tonka-----	IVw	Wet Meadow	10	Wet
Ga:				
Gardena-----	IIE	Loamy	1	Overflow
Gd:				
Gardena-----	IIC	Loamy	1	Overflow
Glyndon-----	IIE	Limy Subirrigated	2KK	Subirrigated
Ge:				
Gardena-----	IIE	Loamy	1	Overflow
Turton-----	IVE	Claypan	9C	Claypan
GgA:				
Great Bend-----	IIC	Loamy	3	Loam
GnA:				
Great Bend-----	IIC	Loamy	3	Loam
Beotia-----	IIC	Loamy	1	Loam
GnB:				
Great Bend-----	IIE	Loamy	3	Loam
Beotia-----	IIC	Loamy	1	Loam
GoA:				
Great Bend-----	IIC	Loamy	3	Loam
Beotia-----	IIC	Loamy	1	Loam
GpA:				
Great Bend-----	IIC	Loamy	3	Loam
Putney-----	IIIs	Loamy	3	Loam
GpB:				
Great Bend-----	IIE	Loamy	3	Loam
Putney-----	IIE	Loamy	3	Loam
GtB:				
Great Bend-----	IIE	Loamy	3	Loam
Zell-----	IIIE	Thin Loamy	8K	Limy Upland
GtC:				
Great Bend-----	IIIE	Loamy	3	Loam
Zell-----	IVE	Thin Loamy	8K	Limy Upland
GzC:				
Great Bend-----	IIIE	Loamy	3	Loam
Zell-----	IVE	Thin Loamy	8K	Limy Upland
Huffton-----	IVE	Thin Loamy	9L	Saline

Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Ecological site	Conservation tree/shrub group	Forage suitability group
HaA: Hamerly-----	IIE	Limy Subirrigated	2KK	Subirrigated
Hb: Hamerly----- Tonka-----	IIE IVw	Limy Subirrigated Wet Meadow	2KK 10	Subirrigated Wet
HcA: Hand----- Bonilla-----	IIC IIC	Loamy Loamy Overflow	3 1	Loam Overflow
HcB: Hand----- Bonilla-----	IIE IIC	Loamy Loamy Overflow	3 1	Loam Overflow
HdA: Hand----- Carthage-----	IIIE IIIE	Sandy Sandy	3 5	Loam Droughty Loam
He: Hand----- Carthage----- Overshue-----	IIIE IIIE IVw	Sandy Sandy Wet Meadow	3 5 10	Loam Droughty Loam Wet
HfC: Hand----- Ethan-----	IIIE IVe	Loamy Thin Upland	3 8K	Loam Limy Upland
HgB: Hand----- Ethan----- Bonilla-----	IIE IIIE IIC	Loamy Thin Upland Loamy Overflow	3 8K 1	Loam Limy Upland Overflow
HgC: Hand----- Ethan----- Bonilla-----	IIIE IVe IIE	Loamy Thin Upland Loamy	3 8K 1	Loam Limy Upland Loam
HhB: Hand----- Ethan----- Carthage-----	IIIE IIIE IIIE	Sandy Thin Upland Sandy	3 8K 5	Loam Limy Upland Droughty Loam
HjB: Hand----- Talmo-----	IIE VIIs	Loamy Very Shallow	3 10	Loam Very Shallow to Gravel
HjC: Hand----- Talmo-----	IIIE VIIs	Loamy Very Shallow	3 10	Loam Not Suited
Hk: Harmony----- Aberdeen-----	IIC IIIs	Clayey Clayey	4 4	Clayey Subsoil Clayey Subsoil
Hm: Harmony----- Aberdeen-----	IIC IIIs	Clayey Clayey	4 4	Clayey Subsoil Clayey Subsoil
Hn: Harmony----- Beotia-----	IIC IIC	Clayey Loamy	4 1	Clayey Subsoil Loam

Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Ecological site	Conservation tree/shrub group	Forage suitability group
Ho:				
Harmony-----	IIC	Clayey	4	Clayey Subsoil
Beotia-----	IIC	Loamy	1	Loam
Hp:				
Harriet-----	VIIs	Saline Lowland	10	Not Suited
Hr:				
Heil-----	VIIs	Closed Depression	10	Not Suited
HsA:				
Henkin-----	IIIe	Sandy	5	Droughty Loam
Blendon-----	IIIe	Sandy	5	Droughty Loam
HsB:				
Henkin-----	IIIe	Sandy	5	Droughty Loam
Blendon-----	IIIe	Sandy	5	Droughty Loam
HtB:				
Houdek-----	IIE	Loamy	3	Loam
Ethan-----	IIIe	Thin Upland	8K	Limy Upland
Prosper-----	IIC	Loamy Overflow	1	Overflow
HtC:				
Houdek-----	IIIe	Loamy	3	Loam
Ethan-----	IVe	Thin Upland	8K	Limy Upland
Prosper-----	IIE	Loamy	1	Loam
HuA:				
Houdek-----	IIC	Loamy	3	Loam
Prosper-----	IIC	Loamy Overflow	1	Overflow
HuB:				
Houdek-----	IIE	Loamy	3	Loam
Prosper-----	IIC	Loamy Overflow	1	Overflow
HwA:				
Houdek-----	IIC	Loamy	3	Loam
Stickney-----	IIIs	Clayey	4	Clayey Subsoil
HxA:				
Houdek-----	IIC	Loamy	3	Loam
Stickney-----	IIIs	Clayey	4	Clayey Subsoil
Tetonka-----	IVw	Wet Meadow	10	Wet
Hy:				
Hoven-----	VIIs	Closed Depression	10	Not Suited
Ie:				
Ipage-----	VIe	Sandy	7	Sand
Els-----	VIe	Subirrigated	2	Subirrigated
Shue-----	IVw	Wet Meadow	2	Wet
Jh:				
Jerauld-----	VIIs	Thin Claypan	10	Not Suited
Hoven-----	VIIs	Closed Depression	10	Not Suited
KaA:				
Kranzburg-----	IIC	Loamy	3	Loam
Brookings-----	IIC	Loamy Overflow	1	Overflow

Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Ecological site	Conservation tree/shrub group	Forage suitability group
KbB:				
Kranzburg-----	IIe	Loamy	3	Loam
Brookings-----	IIC	Loamy Overflow	1	Overflow
Buse-----	IIIE	Thin Loamy	8K	Limy Upland
KcA:				
Kranzburg-----	IIC	Loamy	3	Loam
Cresbard-----	IIIs	Clayey	4	Clayey Subsoil
KtA:				
Kranzburg-----	IIC	Loamy	3	Loam
Cresbard-----	IIIs	Clayey	4	Clayey Subsoil
Tonka-----	IVw	Wet Meadow	10	Wet
KzB:				
Kranzburg-----	IIe	Loamy	3	Loam
Zell-----	IIIE	Thin Loamy	8K	Limy Upland
Aastad-----	IIC	Loamy Overflow	1	Overflow
La:				
La Prairie-----	IIC	Loamy	1	Loam
Lc:				
La Prairie-----	VIw	Loamy Overflow	1	Overflow
Holmquist-----	VIw	Saline Subirrigated	10	Saline
Ld:				
LaDelle-----	IIC	Loamy	1	Loam
Le:				
LaDelle-----	VIw	Loamy Overflow	1	Overflow
Lk:				
Lamo-----	IIw	Subirrigated	2K	Subirrigated
Lm:				
Lamoure-----	IIIw	Subirrigated	2K	Subirrigated
Ln:				
Lawet-----	IVw	Subirrigated	10	Wet
Lo:				
Lawet-----	Vw	Wet Land	10	Not Suited
Lp:				
Lawet-----	IVw	Subirrigated	10	Wet
Davison-----	IIe	Limy Subirrigated	1KK	Subirrigated
LrA:				
Lehr-----	IVs	Shallow Gravel	6G	Very Droughty Loam
Bowdle-----	IIIs	Loamy	6G	Droughty Loam
LrB:				
Lehr-----	IVe	Shallow Gravel	6G	Very Droughty Loam
Bowdle-----	IIIE	Loamy	6G	Droughty Loam
Ls:				
Lowe-----	IVw	Subirrigated	10	Wet
Lt:				
Ludden-----	IVw	Wet Land	10	Wet
Lu:				
Ludden-----	VIIIw	NOT ASSIGNED	10	Not Suited

Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Ecological site	Conservation tree/shrub group	Forage suitability group
Lw: Ludden-----	Vw	Wet Land	10	Not Suited
MaC: Maddock----- Egeland-----	IVe IVe	Sandy Sandy	5 5	Very Droughty Loam Droughty Loam
MdA: Max----- Arnegard-----	IIC IIC	Loamy Loamy Overflow	3 1	Loam Overflow
MdB: Max----- Arnegard-----	IIe IIC	Loamy Loamy Overflow	3 1	Loam Overflow
MgB: Max----- Arnegard----- Zahl-----	IIe IIC IIIE	Loamy Loamy Overflow Thin Loamy	3 1 8K	Loam Overflow Limy Upland
MnB: Max----- Niobell----- Noonan-----	IIe IIIE IVs	Loamy Clayey Claypan	3 4 9C	Loam Clayey Subsoil Claypan
MxC: Max----- Zahl----- Arnegard-----	IIIE IVe IIe	Loamy Thin Loamy Loamy	3 8K 1	Loam Limy Upland Loam
My: Miranda----- Heil-----	VI s VI s	Thin Claypan Closed Depression	10 10	Not Suited Not Suited
Mz: Moritz----- Lowe-----	IIe IVw	Limy Subirrigated Subirrigated	2KK 10	Subirrigated Wet
Na: Nahon----- Aberdeen----- Exline-----	IVs IIIs VI s	Claypan Clayey Thin Claypan	9C 4 10	Claypan Clayey Subsoil Not Suited
Nb: Nahon----- Aberdeen----- Exline-----	IVs IIIs VI s	Claypan Clayey Thin Claypan	9C 4 10	Claypan Clayey Subsoil Not Suited
Nc: Niobell----- Noonan-----	IIIs IVs	Clayey Claypan	4 9C	Clayey Subsoil Claypan
Nd: Niobell----- Noonan----- Heil-----	IIIs IVs VI s	Clayey Claypan Closed Depression	4 9C 10	Clayey Subsoil Claypan Not Suited
NeA: Niobell----- Noonan----- Max-----	IIIs IVs IIC	Clayey Claypan Loamy	4 9C 3	Clayey Subsoil Claypan Loam

Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Ecological site	Conservation tree/shrub group	Forage suitability group
Nm:				
Noonan-----	IVs	Claypan	9C	Claypan
Miranda-----	VIIs	Thin Claypan	10	Not Suited
Nr:				
Northville-----	IIIs	Clayey	4	Clayey Subsoil
Farmsworth-----	IVs	Claypan	9W	Claypan
Nv:				
Northville-----	IIIs	Clayey	4	Clayey Subsoil
Farmsworth-----	IVs	Claypan	9W	Claypan
Hoven-----	VIIs	Closed Depression	10	Not Suited
Ov:				
Overshue-----	IVw	Wet Meadow	10	Wet
Pa:				
Parnell-----	Vw	Shallow Marsh	10	Not Suited
Pc:				
Parshall-----	IIIs	Sandy	1	Loam
PeA:				
Peever-----	IIIs	Clayey	4	Clayey Subsoil
PgB:				
Peever-----	IIIE	Clayey	4	Clayey Subsoil
Buse-----	IIIE	Thin Loamy	8K	Limy Upland
PoA:				
Peever-----	IIIs	Clayey	4	Clayey Subsoil
Cavour-----	IVs	Claypan	9C	Claypan
Pp:				
Orthents-----	VIIIs	NOT ASSIGNED	10	Not Suited
Pr:				
Playmoor-----	IVw	Saline Subirrigated	10	Saline
Py:				
Playmoor-----	VIw	Saline Subirrigated	10	Saline
Lamoure-----	VIw	Subirrigated	10	Wet
Ra:				
Ranslo-----	IVs	Subirrigated	9W	Claypan
Re:				
Ranslo-----	IVs	Subirrigated	9W	Claypan
Harriet-----	VIIs	Saline Lowland	10	Not Suited
RfA:				
Renshaw-----	IVs	Shallow Gravel	6G	Very Droughty Loam
Fordville-----	IIIs	Loamy	6G	Droughty Loam
RfB:				
Renshaw-----	IVe	Shallow Gravel	6G	Very Droughty Loam
Fordville-----	IIIE	Loamy	6G	Droughty Loam
So:				
Southam-----	VIIIw	NOT ASSIGNED	10	Not Suited
St:				
Stickney-----	IIIs	Clayey	4	Clayey Subsoil
Dudley-----	IVs	Claypan	9C	Claypan

Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Ecological site	Conservation tree/shrub group	Forage suitability group
Su:				
Stickney-----	IIIs	Clayey	4	Clayey Subsoil
Dudley-----	IVs	Claypan	9C	Claypan
Hoven-----	VIIs	Closed Depression	10	Not Suited
Sw:				
Straw-----	VIw	Loamy Overflow	1	Overflow
Sx:				
Straw-----	IIC	Loamy	1	Loam
TbE:				
Talmo-----	VIIIs	Very Shallow	10	Not Suited
Ethan-----	VIIIs	Thin Upland	10	Not Suited
Te:				
Tetonka-----	IVw	Wet Meadow	10	Wet
Tk:				
Toko-----	IVw	Wet Meadow	10	Wet
Tm:				
Toko-----	Vw	Shallow Marsh	10	Not Suited
Tn:				
Tonka-----	IVw	Wet Meadow	10	Wet
To:				
Tonka-----	IVw	Wet Meadow	10	Wet
Rimlap-----	IVw	Wet Meadow	10	Wet
Us:				
Udorthents-----	IVe	NOT ASSIGNED	10	Not Suited
Va:				
Vallars-----	IVw	Subirrigated	10	Wet
Hamerly-----	IIE	Limy Subirrigated	2KK	Subirrigated
VgA:				
Vang-----	IIIs	Loamy	6G	Droughty Loam
WaA:				
Williams-----	IIC	Loamy	3	Loam
Bowbells-----	IIC	Loamy Overflow	1	Overflow
WaB:				
Williams-----	IIE	Loamy	3	Loam
Bowbells-----	IIC	Loamy Overflow	1	Overflow
WbA:				
Williams-----	IIC	Loamy	3	Loam
Bowbells-----	IIC	Loamy Overflow	1	Overflow
Tonka-----	IVw	Wet Meadow	10	Wet
WbB:				
Williams-----	IIE	Loamy	3	Loam
Bowbells-----	IIC	Loamy Overflow	1	Overflow
Tonka-----	IVw	Wet Meadow	10	Wet
WcA:				
Williams-----	IIC	Loamy	3	Loam
Niobell-----	IIIs	Clayey	4	Clayey Subsoil

Interpretive Groups--Continued

Map symbol and soil name	Land capability classification	Ecological site	Conservation tree/shrub group	Forage suitability group
WcB:				
Williams-----	IIe	Loamy	3	Loam
Niobell-----	IIIe	Clayey	4	Clayey Subsoil
WdA:				
Williams-----	IIC	Loamy	3	Loam
Niobell-----	IIIs	Clayey	4	Clayey Subsoil
Tonka-----	IVw	Wet Meadow	10	Wet
WhD:				
Williams-----	IIIe	Loamy	3	Loam
Vida-----	IVe	Loamy	3	Loam
WmB:				
Williams-----	IIe	Loamy	3	Loam
Zahl-----	IIIe	Thin Loamy	8K	Limy Upland
Bowbells-----	IIC	Loamy Overflow	1	Overflow
WmC:				
Williams-----	IIIe	Loamy	3	Loam
Zahl-----	IVe	Thin Loamy	8K	Limy Upland
Bowbells-----	IIe	Loamy	1	Loam
Wn:				
Winship-----	IIw	Loamy Overflow	2	Subirrigated
Tonka-----	IVw	Wet Meadow	10	Wet
Wo:				
Winship-----	IIw	Loamy Overflow	2	Subirrigated
Tonka-----	IVw	Wet Meadow	10	Wet
Ws:				
Woonsocket-----	IIIe	Sandy	5	Droughty Loam
Whitelake-----	IVe	Claypan	9L	Claypan
Wt:				
Worthing-----	Vw	Shallow Marsh	10	Not Suited
Ww:				
Worthing-----	VIIIw	NOT ASSIGNED	10	Not Suited
ZaE:				
Zahill-----	VIIe	Thin Loamy	10	Not Suited
ZbC:				
Zahl-----	IVe	Thin Loamy	8K	Limy Upland
Max-----	IIIe	Loamy	3	Loam
ZbD:				
Zahl-----	VIIe	Thin Loamy	10	Limy Upland
Max-----	IVe	Loamy	3	Loam
ZgD:				
Zell-----	VIe	Thin Loamy	10	Limy Upland
Great Bend-----	IIIe	Loamy	3	Loam

Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
Aa	Aastad loam, 0 to 2 percent slopes-----	706	*
Ab	Aastad-Hamerly loams, 0 to 2 percent slopes-----	690	*
Ad	Aastad-Tonka complex, 0 to 2 percent slopes-----	2,136	0.2
Ae	Aberdeen-Nahon silt loams, till substratum, 0 to 2 percent slopes-----	1,929	0.2
Ah	Aberdeen-Nahon silty clay loams, 0 to 2 percent slopes-----	50,267	5.2
An	Aberdeen-Nahon-Heil silt loams, 0 to 2 percent slopes-----	15,993	1.7
Ao	Aberdeen-Nahon-Heil silt loams, till substratum, 0 to 2 percent slopes---	2,588	0.3
At	Aquents, loamy, 0 to 2 percent slopes-----	38	*
BaC	Beadle loam, 6 to 9 percent slopes-----	171	*
BdA	Beadle-Dudley complex, 0 to 2 percent slopes-----	8,972	0.9
BeA	Beadle-Stickney complex, 0 to 2 percent slopes-----	25,569	2.6
BeB	Beadle-Stickney complex, 1 to 6 percent slopes-----	776	*
BfA	Beadle-Stickney complex, 0 to 2 percent slopes, very stony-----	2,850	0.3
BfB	Beadle-Stickney complex, 1 to 6 percent slopes, very stony-----	523	*
Bg	Bearden silt loam, 0 to 2 percent slopes-----	1,106	0.1
Bk	Bearden-Tonka silt loams, 0 to 2 percent slopes-----	1,752	0.2
Bo	Beotia silt loam, 0 to 2 percent slopes-----	3,467	0.4
Br	Beotia-Rondell silt loams, 0 to 3 percent slopes-----	2,672	0.3
Bs	Beotia-Winship silt loams, 0 to 2 percent slopes-----	2,386	0.2
Bt	Beotia-Winship silt loams, till substratum, 0 to 2 percent slopes-----	934	*
Bu	Bon loam, 0 to 2 percent slopes-----	2,584	0.3
Bw	Bon loam, channeled-----	2,175	0.2
BxD	Buse-Barnes loams, 9 to 20 percent slopes-----	1,960	0.2
ByE	Buse-Barnes loams, 9 to 40 percent slopes, very stony-----	1,797	0.2
BzE	Buse-Langhei complex, 15 to 40 percent slopes-----	528	*
Ca	Camtown-Turton loams, 0 to 2 percent slopes-----	1,309	0.1
Cf	Cavour-Ferney loams, 0 to 2 percent slopes-----	16,277	1.7
Co	Colvin silty clay loam, saline, 0 to 1 percent slopes-----	367	*
Cr	Cresbard-Cavour loams, 0 to 2 percent slopes-----	11,734	1.2
Cs	Cresbard-Cavour-Heil complex, 0 to 2 percent slopes-----	18,471	1.9
Ct	Crossplain-Tetonka complex, 0 to 1 percent slopes-----	3,217	0.3
Da	Davis-Northville complex, 0 to 2 percent slopes-----	1,613	0.2
Db	Davison loam, 0 to 2 percent slopes-----	829	*
Dd	Davison-Tetonka complex, 0 to 2 percent slopes-----	1,007	0.1
DeA	Delmont-Enet loams, 0 to 2 percent slopes-----	4,081	0.4
Dk	Dimo loam, 0 to 2 percent slopes-----	1,502	0.2
Dm	Dimo-Grat loams, 0 to 2 percent slopes-----	940	*
DoA	Doland-Embsden complex, 0 to 3 percent slopes-----	3,193	0.3
Dq	Dovecreek silt loam, 0 to 2 percent slopes-----	2,497	0.3
Dr	Dovray silty clay, 0 to 1 percent slopes-----	2,338	0.2
Du	Dudley-Jerauld silt loams, 0 to 2 percent slopes-----	3,438	0.4
Dx	Durrstein silt loam, 0 to 1 percent slopes-----	745	*
Ea	Eckman very fine sandy loam, 0 to 2 percent slopes-----	79	*
EcA	Eckman-Gardena very fine sandy loams, 0 to 2 percent slopes-----	3,490	0.4
EcB	Eckman-Gardena very fine sandy loams, 2 to 6 percent slopes-----	735	*
EdB	Eckman-Zell very fine sandy loams, 2 to 6 percent slopes-----	1,390	0.1
EeB	Edgeley loam, 2 to 6 percent slopes-----	152	*
EeC	Edgeley loam, 6 to 9 percent slopes-----	833	*
EeD	Edgeley loam, 9 to 20 percent slopes-----	694	*
EgA	Egeland-Embsden complex, 0 to 2 percent slopes-----	1,487	0.2
EgB	Egeland-Embsden complex, 2 to 6 percent slopes-----	311	*
Ek	Elsmere loamy sand, 0 to 2 percent slopes-----	482	*
EmE	Ethan-Betts loams, 15 to 40 percent slopes-----	179	*
EnD	Ethan-Hand loams, 9 to 20 percent slopes-----	3,073	0.3
Er	Exline-Aberdeen-Nahon silt loams, 0 to 2 percent slopes-----	13,729	1.4
Et	Exline-Aberdeen-Nahon silt loams, till substratum, 0 to 2 percent slopes-	3,671	0.4
Ew	Exline-Heil silt loams, 0 to 2 percent slopes-----	15,949	1.7
Ex	Exline-Heil silt loams, till substratum, 0 to 2 percent slopes-----	1,355	0.1
EyA	Exline-Putney silt loams, 1 to 4 percent slopes-----	1,162	0.1
Fa	Farmsworth-Durrstein silt loams, 0 to 2 percent slopes-----	4,729	0.5
Fe	Ferney-Heil complex, 0 to 2 percent slopes-----	8,863	0.9
Ff	Forestburg-Elsmere loamy sands, 0 to 2 percent slopes-----	6,074	0.6

* See footnote at end of table.

Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
Fh	Forestburg-Elsmere-Toko complex, 0 to 2 percent slopes-----	2,662	0.3
FmA	Forman-Aastad loams, 0 to 3 percent slopes-----	8,094	0.8
FmB	Forman-Aastad loams, 1 to 6 percent slopes-----	855	*
FnC	Forman-Buse loams, 6 to 9 percent slopes-----	375	*
FrB	Forman-Buse-Aastad loams, 1 to 6 percent slopes-----	18,385	1.9
FrC	Forman-Buse-Aastad loams, 2 to 9 percent slopes-----	3,855	0.4
FsA	Forman-Cresbard loams, 0 to 2 percent slopes-----	34,969	3.6
FsB	Forman-Cresbard loams, 2 to 6 percent slopes-----	8,189	0.8
FtA	Forman-Cresbard-Tonka complex, 0 to 2 percent slopes-----	6,289	0.7
Ga	Gardena very fine sandy loam, 0 to 2 percent slopes-----	940	*
Gd	Gardena-Glyndon silt loams, 0 to 2 percent slopes-----	792	*
Ge	Gardena-Turton very fine sandy loams, 0 to 2 percent slopes-----	1,070	0.1
GgA	Great Bend silt loam, 0 to 2 percent slopes-----	611	*
GnA	Great Bend-Beotia silt loams, 0 to 2 percent slopes-----	59,168	6.1
GnB	Great Bend-Beotia silt loams, 1 to 6 percent slopes-----	4,231	0.4
GnA	Great Bend-Beotia silt loams, till substratum, 0 to 2 percent slopes-----	2,976	0.3
GpA	Great Bend-Putney silt loams, 0 to 2 percent slopes-----	6,272	0.6
GpB	Great Bend-Putney silt loams, 2 to 4 percent slopes-----	2,215	0.2
GtB	Great Bend-Zell silt loams, 2 to 6 percent slopes-----	21,692	2.2
GtC	Great Bend-Zell silt loams, 4 to 9 percent slopes-----	5,444	0.6
GzC	Great Bend-Zell-Huffton silt loams, 4 to 9 percent slopes-----	683	*
HaA	Hamerly loam, 0 to 2 percent slopes-----	839	*
Hb	Hamerly-Tonka complex, 0 to 2 percent slopes-----	2,390	0.2
HcA	Hand-Bonilla loams, 0 to 3 percent slopes-----	4,812	0.5
HcB	Hand-Bonilla loams, 1 to 6 percent slopes-----	247	*
HdA	Hand-Carthage fine sandy loams, 0 to 3 percent slopes-----	6,734	0.7
He	Hand-Carthage-Overshue fine sandy loams, 0 to 3 percent slopes-----	5,409	0.6
HfC	Hand-Ethan loams, 6 to 9 percent slopes-----	730	*
HgB	Hand-Ethan-Bonilla loams, 1 to 6 percent slopes-----	26,643	2.8
HgC	Hand-Ethan-Bonilla loams, 2 to 9 percent slopes-----	5,288	0.5
HhB	Hand-Ethan-Carthage complex, 1 to 6 percent slopes-----	6,083	0.6
HjB	Hand-Talmo complex, 2 to 6 percent slopes-----	2,648	0.3
HjC	Hand-Talmo complex, 6 to 9 percent slopes-----	721	*
Hk	Harmony-Aberdeen silt loams, till substratum, 0 to 2 percent slopes-----	7,880	0.8
Hm	Harmony-Aberdeen silty clay loams, 0 to 2 percent slopes-----	45,977	4.8
Hn	Harmony-Beotia silt loams, 0 to 2 percent slopes-----	22,786	2.4
Ho	Harmony-Beotia silt loams, till substratum, 0 to 2 percent slopes-----	3,647	0.4
Hp	Harriet loam, 0 to 1 percent slopes-----	3,757	0.4
Hr	Heil silt loam, 0 to 1 percent slopes-----	5,390	0.6
HsA	Henkin-Blendon fine sandy loams, 0 to 2 percent slopes-----	2,275	0.2
HsB	Henkin-Blendon fine sandy loams, 2 to 6 percent slopes-----	856	*
HtB	Houdek-Ethan-Prosper loams, 1 to 6 percent slopes-----	5,208	0.5
HtC	Houdek-Ethan-Prosper loams, 2 to 9 percent slopes-----	52	*
HuA	Houdek-Prosper loams, 0 to 2 percent slopes-----	522	*
HuB	Houdek-Prosper loams, 1 to 6 percent slopes-----	337	*
HwA	Houdek-Stickney complex, 0 to 2 percent slopes-----	14,487	1.5
HxA	Houdek-Stickney-Tetonka complex, 0 to 2 percent slopes-----	8,868	0.9
Hy	Hoven silt loam, 0 to 1 percent slopes-----	1,555	0.2
Ie	Ipage-Els-Shue complex, 0 to 6 percent slopes-----	1,840	0.2
Jh	Jerauld-Hoven silt loams, 0 to 2 percent slopes-----	2,394	0.2
KaA	Kranzburg-Brookings silt loams, 0 to 2 percent slopes-----	6,941	0.7
KbB	Kranzburg-Brookings-Buse complex, 1 to 6 percent slopes-----	5,848	0.6
KcA	Kranzburg-Cresbard silt loams, 0 to 2 percent slopes-----	14,179	1.5
KtA	Kranzburg-Cresbard-Tonka silt loams, 0 to 2 percent slopes-----	1,768	0.2
KzB	Kranzburg-Zell-Aastad complex, 1 to 6 percent slopes-----	2,025	0.2
La	La Prairie loam, 0 to 2 percent slopes-----	2,872	0.3
Lc	La Prairie-Holmquist loams, channeled-----	4,999	0.5
Ld	LaDelle silt loam, 0 to 2 percent slopes-----	9,999	1.0
Le	LaDelle silt loam, channeled-----	4,057	0.4
Lk	Lamo silty clay loam, 0 to 1 percent slopes-----	250	*
Lm	Lamoure silty clay loam, 0 to 1 percent slopes-----	4,225	0.4

* See footnote at end of table.

Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
Ln	Lawet loam, 0 to 2 percent slopes-----	2,656	0.3
Lo	Lawet loam, wet, 0 to 1 percent slopes-----	879	*
Lp	Lawet-Davison loams, 0 to 2 percent slopes-----	1,785	0.2
LrA	Lehr-Bowdle loams, 0 to 3 percent slopes-----	548	*
LrB	Lehr-Bowdle loams, 3 to 6 percent slopes-----	482	*
Ls	Lowe loam, 0 to 1 percent slopes-----	1,119	0.1
Lt	Ludden silty clay, 0 to 1 percent slopes-----	6,461	0.7
Lu	Ludden silty clay, ponded-----	2,136	0.2
Lw	Ludden silty clay, wet, 0 to 1 percent slopes-----	5,417	0.6
M-W	Miscellaneous water-----	165	*
MaC	Maddock-Egeland sandy loams, 6 to 9 percent slopes-----	48	*
MdA	Max-Arnegard loams, 0 to 3 percent slopes-----	4,057	0.4
MdB	Max-Arnegard loams, 1 to 6 percent slopes-----	633	*
MgB	Max-Arnegard-Zahl loams, 1 to 6 percent slopes-----	22,784	2.4
MnB	Max-Niobell-Noonan loams, 2 to 6 percent slopes-----	346	*
MxC	Max-Zahl-Arnegard loams, 2 to 9 percent slopes-----	2,805	0.3
My	Miranda-Heil complex, 0 to 2 percent slopes-----	548	*
Mz	Moritz-Lowe loams, 0 to 2 percent slopes-----	3,985	0.4
Na	Nahon-Aberdeen-Exline silt loams, 0 to 2 percent slopes-----	52,262	5.4
Nb	Nahon-Aberdeen-Exline silt loams, till substratum, 0 to 2 percent slopes-----	4,081	0.4
Nc	Niobell-Noonan loams, 0 to 2 percent slopes-----	2,141	0.2
Nd	Niobell-Noonan-Heil complex, 0 to 2 percent slopes-----	1,578	0.2
NeA	Niobell-Noonan-Max loams, 0 to 3 percent slopes-----	286	*
Nm	Noonan-Miranda loams, 0 to 2 percent slopes-----	1,322	0.1
Nr	Northville-Farmsworth silt loams, 0 to 2 percent slopes-----	5,772	0.6
Nv	Northville-Farmsworth-Hoven silt loams, 0 to 2 percent slopes-----	3,134	0.3
Ov	Overshue fine sandy loam, 0 to 1 percent slopes-----	153	*
Pa	Parnell silty clay loam, 0 to 1 percent slopes-----	3,097	0.3
Pc	Parshall loams, 0 to 3 percent slopes-----	337	*
PeA	Peever clay loam, 0 to 2 percent slopes-----	201	*
PgB	Peever-Buse clay loams, 1 to 4 percent slopes-----	988	0.1
PoA	Peever-Cavour complex, 0 to 2 percent slopes-----	1,112	0.1
Pp	Pits, gravel and sand-----	687	*
Pr	Playmoor silty clay loam, 0 to 1 percent slopes-----	3,238	0.3
Py	Playmoor-Lamoure silty clay loams, channeled-----	97	*
Ra	Ranslo silty clay loam, 0 to 1 percent slopes-----	6,469	0.7
Re	Ranslo-Harriet loams, 0 to 2 percent slopes-----	15,178	1.6
RfA	Renshaw-Fordville loams, 0 to 2 percent slopes-----	461	*
RfB	Renshaw-Fordville loams, 2 to 6 percent slopes-----	531	*
So	Southam silty clay loam, 0 to 1 percent slopes-----	1,895	0.2
St	Stickney-Dudley silt loams, 0 to 2 percent slopes-----	3,158	0.3
Su	Stickney-Dudley-Hoven silt loams, 0 to 2 percent slopes-----	15,359	1.6
Sw	Straw loam, channeled-----	1,399	0.1
Sx	Straw loam, 0 to 2 percent slopes-----	251	*
TbE	Talmo-Ethan complex, 9 to 40 percent slopes, very stony-----	448	*
Te	Tetonka silt loam, 0 to 1 percent slopes-----	2,669	0.3
Tk	Toko fine sandy loam, 0 to 1 percent slopes-----	923	*
Tm	Toko fine sandy loam, wet, 0 to 1 percent slopes-----	511	*
Tn	Tonka silt loam, 0 to 1 percent slopes-----	2,976	0.3
To	Tonka-Rimlap silt loams, 0 to 1 percent slopes-----	2,586	0.3
Us	Udorthents, silty, 0 to 2 percent slopes-----	145	*
Va	Vallers-Hamerly loams, 0 to 2 percent slopes-----	1,745	0.2
VgA	Vang loam, 0 to 2 percent slopes-----	288	*
W	Water-----	5,732	0.6
WaA	Williams-Bowbells loams, 0 to 3 percent slopes-----	1,614	0.2
WaB	Williams-Bowbells loams, 1 to 6 percent slopes-----	542	*
WbA	Williams-Bowbells-Tonka complex, 0 to 3 percent slopes-----	2,126	0.2
WbB	Williams-Bowbells-Tonka complex, 0 to 6 percent slopes-----	694	*
WcA	Williams-Niobell loams, 0 to 3 percent slopes-----	11,576	1.2
WcB	Williams-Niobell loams, 3 to 6 percent slopes-----	990	0.1

* See footnote at end of table.

Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
WdA	Williams-Niobell-Tonka complex, 0 to 3 percent slopes-----	7,967	0.8
WhD	Williams-Vida loams, 6 to 15 percent slopes-----	72	*
WmB	Williams-Zahl-Bowbells loams, 1 to 6 percent slopes-----	3,199	0.3
WmC	Williams-Zahl-Bowbells loams, 2 to 9 percent slopes-----	257	*
Wn	Winship-Tonka silt loams, 0 to 1 percent slopes-----	11,621	1.2
Wo	Winship-Tonka silt loams, till substratum, 0 to 1 percent slopes-----	1,769	0.2
Ws	Woonsocket-Whitelake fine sandy loams, 0 to 2 percent slopes-----	3,327	0.3
Wt	Worthing silty clay loam, 0 to 1 percent slopes-----	1,240	0.1
Ww	Worthing silty clay loam, ponded-----	1,475	0.2
ZaE	Zahill loam, 15 to 40 percent slopes-----	132	*
ZbC	Zahl-Max loams, 6 to 9 percent slopes-----	780	*
ZbD	Zahl-Max loams, 9 to 20 percent slopes-----	887	*
ZgD	Zell-Great Bend silt loams, 6 to 25 percent slopes-----	1,291	0.1
	Total-----	965,492	100.0

* Less than 0.1 percent.

Soil Productivity Ratings

Prepared by SDSU, Dec. 2000, D. Malo

(Absence of an entry indicates that the data were not available.)

Map symbol	Soil name	Crop rating	Range rating	Prod rating
Aa	Aastad loam, 0 to 2 percent slopes-----	95.3	50.5	95.3
Ab	Aastad-Hamerly loams, 0 to 2 percent slopes-----	83.6	46.7	83.6
Ad	Aastad-Tonka complex, 0 to 2 percent slopes-----	74.9	46.5	74.9
Ae	Aberdeen-Nahon silt loams, till substratum, 0 to 2 percent slopes-----	62.1	27.7	62.1
Ah	Aberdeen-Nahon silty clay loams, 0 to 2 percent slopes-----	62.1	27.7	62.1
An	Aberdeen-Nahon-Heil silt loams, 0 to 2 percent slopes-----	48.1	31.1	48.1
Ao	Aberdeen-Nahon-Heil silt loams, till substratum, 0 to 2 percent slopes--	48.1	31.1	48.1
At	Aquents, loamy, 0 to 2 percent slopes-----	--	21.7	21.7
BaC	Beadle loam, 6 to 9 percent slopes-----	57.0	28.1	57.0
BdA	Beadle-Dudley complex, 0 to 2 percent slopes-----	64.4	27.7	64.4
BeA	Beadle-Stickney complex, 0 to 2 percent slopes-----	76.8	30.5	76.8
BeB	Beadle-Stickney complex, 1 to 6 percent slopes-----	70.9	29.9	70.9
BfA	Beadle-Stickney complex, 0 to 2 percent slopes, very stony-----	--	24.6	24.6
BfB	Beadle-Stickney complex, 1 to 6 percent slopes, very stony-----	--	23.5	23.5
Bg	Bearden silt loam, 0 to 2 percent slopes-----	71.8	42.2	71.8
Bk	Bearden-Tonka silt loams, 0 to 2 percent slopes-----	60.9	41.2	60.9
Bo	Beotia silt loam, 0 to 2 percent slopes-----	100.0	31.2	100.0
Br	Beotia-Rondell silt loams, 0 to 3 percent slopes-----	89.4	35.5	89.4
Bs	Beotia-Winship silt loams, 0 to 2 percent slopes-----	91.4	50.5	91.4
Bt	Beotia-Winship silt loams, till substratum, 0 to 2 percent slopes-----	91.4	50.5	91.4
Bu	Bon loam, 0 to 2 percent slopes-----	94.8	50.5	94.8
Bw	Bon loam, channeled-----	18.7	35.9	35.9
BxD	Buse-Barnes loams, 9 to 20 percent slopes-----	41.9	26.4	41.9
ByE	Buse-Barnes loams, 9 to 40 percent slopes, very stony-----	--	23.1	23.1
BzE	Buse-Langhei complex, 15 to 40 percent slopes-----	18.7	23.3	23.3
Ca	Camtown-Turton loams, 0 to 2 percent slopes-----	60.4	27.7	60.4
Cf	Cavour-Ferney loams, 0 to 2 percent slopes-----	23.2	21.0	23.2
Co	Colvin silty clay loam, saline, 0 to 1 percent slopes-----	16.7	49.1	49.1
Cr	Cresbard-Cavour loams, 0 to 2 percent slopes-----	56.6	28.0	56.6
Cs	Cresbard-Cavour-Heil complex, 0 to 2 percent slopes-----	40.3	31.1	40.3
Ct	Crossplain-Tetonka complex, 0 to 1 percent slopes-----	74.3	46.5	74.3
Da	Davis-Northville complex, 0 to 2 percent slopes-----	83.4	42.0	83.4
Db	Davison loam, 0 to 2 percent slopes-----	67.7	42.2	67.7
Dd	Davison-Tetonka complex, 0 to 2 percent slopes-----	54.6	41.1	54.6
DeA	Delmont-Enet loams, 0 to 2 percent slopes-----	40.6	23.9	40.6
Dk	Dimo loam, 0 to 2 percent slopes-----	74.6	50.5	74.6
Dm	Dimo-Grat loams, 0 to 2 percent slopes-----	60.3	46.0	60.3
DoA	Doland-Embsen complex, 0 to 3 percent slopes-----	79.8	30.6	79.8
Dq	Dovecreek silt loam, 0 to 2 percent slopes-----	95.1	50.5	95.1
Dr	Dovray silty clay, 0 to 1 percent slopes-----	19.3	34.8	34.8
Du	Dudley-Jerauld silt loams, 0 to 2 percent slopes-----	23.7	21.0	23.7
Dx	Durrstein silt loam, 0 to 1 percent slopes-----	2.6	31.6	31.6
Ea	Eckman very fine sandy loam, 0 to 2 percent slopes-----	89.5	31.2	89.5
EcA	Eckman-Gardena very fine sandy loams, 0 to 2 percent slopes-----	93.4	31.2	93.4
EcB	Eckman-Gardena very fine sandy loams, 2 to 6 percent slopes-----	88.2	30.1	88.2
EdB	Eckman-Zell very fine sandy loams, 2 to 6 percent slopes-----	79.2	28.8	79.2
EeB	Edgeley loam, 2 to 6 percent slopes-----	70.6	30.1	70.6
EeC	Edgeley loam, 6 to 9 percent slopes-----	55.5	29.0	55.5
EeD	Edgeley loam, 9 to 20 percent slopes-----	45.8	27.3	45.8
EgA	Egeland-Embsen complex, 0 to 2 percent slopes-----	63.8	31.0	63.8
EgB	Egeland-Embsen-complex, 2 to 6 percent slopes-----	58.9	29.9	58.9
Ek	Elsmere loamy sand, 0 to 2 percent slopes-----	83.6	67.9	83.6
EmE	Ethan-Betts loams, 15 to 40 percent slopes-----	18.0	23.3	23.3
EnD	Ethan-Hand loams, 9 to 20 percent slopes-----	41.4	26.4	41.4
Er	Exline-Aberdeen-Nahon silt loams, 0 to 2 percent slopes-----	32.8	22.4	32.8
Et	Exline-Aberdeen-Nahon silt loams, till substratum, 0 to 2 percent slopes-----	32.8	22.4	32.8
Ew	Exline-Heil silt loams, 0 to 2 percent slopes-----	7.5	28.3	28.3
Ex	Exline-Heil silt loams, till substratum, 0 to 2 percent slopes-----	7.5	28.3	28.3
EyA	Exline-Putney silt loams, 1 to 4 percent slopes-----	41.7	23.4	41.7
Fa	Farmsworth-Durrstein silt loams, 0 to 2 percent slopes-----	16.3	28.0	28.0
Fe	Ferney-Heil complex, 0 to 2 percent slopes-----	7.4	29.8	29.8

Soil Productivity Ratings--Continued

Map symbol	Soil name	Crop rating	Range rating	Prod rating
Ff	Forestburg-Elsmere loamy sands, 0 to 2 percent slopes-----	78.7	44.5	78.7
Fh	Forestburg-Elsmere-Toko complex, 0 to 2 percent slopes-----	69.1	42.8	69.1
FmA	Forman-Aastad loams, 0 to 3 percent slopes-----	89.8	39.3	89.8
FmB	Forman-Aastad loams, 1 to 6 percent slopes-----	84.7	37.7	84.7
FnC	Forman-Buse loams, 6 to 9 percent slopes-----	58.5	27.9	58.5
FrB	Forman-Buse-Aastad loams, 1 to 6 percent slopes-----	77.0	32.6	77.0
FrC	Forman-Buse-Aastad loams, 2 to 9 percent slopes-----	64.1	28.3	64.1
FsA	Forman-Cresbard loams, 0 to 2 percent slopes-----	79.3	31.0	79.3
FsB	Forman-Cresbard loams, 2 to 6 percent slopes-----	74.2	29.9	74.2
FtA	Forman-Cresbard-Tonka complex, 0 to 2 percent slopes-----	71.2	32.9	71.2
Ga	Gardena very fine sandy loam, 0 to 2 percent slopes-----	97.3	31.2	97.3
Gd	Gardena-Glyndon silt loams, 0 to 2 percent slopes-----	85.5	35.5	85.5
Ge	Gardena-Turton very fine sandy loams, 0 to 2 percent slopes-----	67.9	28.2	67.9
GgA	Great Bend silt loam, 0 to 2 percent slopes-----	91.4	31.2	91.4
GnA	Great Bend-Beotia silt loams, 0 to 2 percent slopes-----	95.8	31.2	95.8
GnB	Great Bend-Beotia silt loams, 1 to 6 percent slopes-----	90.6	30.9	90.6
GoA	Great Bend-Beotia silt loams, till substratum, 0 to 2 percent slopes----	95.8	31.2	95.8
GpA	Great Bend-Putney silt loams, 0 to 2 percent slopes-----	89.2	31.2	89.2
GpB	Great Bend-Putney silt loams, 2 to 4 percent slopes-----	84.8	30.1	84.8
GtB	Great Bend-Zell silt loams, 2 to 6 percent slopes-----	79.9	28.8	79.9
GtC	Great Bend-Zell silt loams, 4 to 9 percent slopes-----	65.8	28.3	65.8
GzC	Great Bend-Zell-Huffton silt loams, 4 to 9 percent slopes-----	61.5	28.0	61.5
HaA	Hamerly loam, 0 to 2 percent slopes-----	68.1	42.2	68.1
Hb	Hamerly-Tonka complex, 0 to 2 percent slopes-----	54.6	41.1	54.6
HcA	Hand-Bonilla loams, 0 to 3 percent slopes-----	86.9	39.3	86.9
HcB	Hand-Bonilla loams, 1 to 6 percent slopes-----	81.3	38.0	81.3
HdA	Hand-Carthage fine sandy loams, 0 to 3 percent slopes-----	86.9	30.5	86.9
He	Hand-Carthage-Overshue fine sandy loams, 0 to 3 percent slopes-----	72.9	26.6	72.9
HfC	Hand-Ethan loams, 6 to 9 percent slopes-----	55.6	27.9	55.6
HgB	Hand-Ethan-Bonilla loams, 1 to 6 percent slopes-----	75.4	32.6	75.4
HgC	Hand-Ethan-Bonilla loams, 2 to 9 percent slopes-----	63.3	28.3	63.3
HhB	Hand-Ethan-Carthage complex, 1 to 6 percent slopes-----	76.8	29.1	76.8
HjB	Hand-Talmo complex, 2 to 6 percent slopes-----	44.8	21.1	44.8
HjC	Hand-Talmo complex, 6 to 9 percent slopes-----	36.3	20.1	36.3
Hk	Harmony-Aberdeen silt loams, till substratum, 0 to 2 percent slopes-----	84.2	30.5	84.2
Hm	Harmony-Aberdeen silty clay loams, 0 to 2 percent slopes-----	84.2	30.5	84.2
Hn	Harmony-Beotia silt loams, 0 to 2 percent slopes-----	92.6	30.8	92.6
Ho	Harmony-Beotia silt loams, till substratum, 0 to 2 percent slopes-----	92.6	30.8	92.6
Hp	Harriet loam, 0 to 1 percent slopes-----	2.6	31.6	31.6
Hr	Heil silt loam, 0 to 1 percent slopes-----	2.6	47.4	47.4
HsA	Henkin-Blendon fine sandy loams, 0 to 2 percent slopes-----	59.2	31.0	59.2
HsB	Henkin-Blendon fine sandy loams, 2 to 6 percent slopes-----	53.7	29.9	53.7
HtB	Houdek-Ethan-Prosper loams, 1 to 6 percent slopes-----	75.4	32.6	75.4
HtC	Houdek-Ethan-Prosper loams, 2 to 9 percent slopes-----	63.3	28.3	63.3
HuA	Houdek-Prosper loams, 0 to 2 percent slopes-----	86.4	39.3	86.4
HuB	Houdek-Prosper loams, 1 to 6 percent slopes-----	81.3	37.7	81.3
HwA	Houdek-Stickney complex, 0 to 2 percent slopes-----	78.0	31.0	78.0
HxA	Houdek-Stickney-Tetonka complex, 0 to 2 percent slopes-----	71.7	32.9	71.7
Hy	Hoven silt loam, 0 to 1 percent slopes-----	2.6	47.4	47.4
Ie	Ipaga-Els-Shue complex, 0 to 6 percent slopes-----	60.5	42.2	60.5
Jh	Jerauld-Hoven silt loams, 0 to 2 percent slopes-----	7.4	28.3	28.3
KaA	Kranzburg-Brookings silt loams, 0 to 2 percent slopes-----	95.8	39.3	95.8
KbB	Kranzburg-Brookings-Buse complex, 1 to 6 percent slopes-----	80.9	34.9	80.9
KcA	Kranzburg-Cresbard silt loams, 0 to 2 percent slopes-----	84.0	31.0	84.0
KtA	Kranzburg-Cresbard-Tonka silt loams, 0 to 2 percent slopes-----	74.1	32.9	74.1
KzB	Kranzburg-Zell-Aastad complex, 1 to 6 percent slopes-----	80.9	32.4	80.9
La	La Prairie loam, 0 to 2 percent slopes-----	96.3	31.2	96.3
Lc	La Prairie-Holmquist loams, channeled-----	10.6	37.1	37.1
Ld	LaDelle silt loam, 0 to 2 percent slopes-----	99.0	31.2	99.0
Le	LaDelle silt loam, channeled-----	19.7	35.9	35.9
Lk	Lamo silty clay loam, 0 to 1 percent slopes-----	53.3	67.9	67.9
Lm	Lamoure silty clay loam, 0 to 1 percent slopes-----	44.8	67.9	67.9
Ln	Lawet loam, 0 to 2 percent slopes-----	29.2	67.9	67.9
Lo	Lawet loam, wet, 0 to 1 percent slopes-----	16.0	32.1	32.1

Soil Productivity Ratings--Continued

Map symbol	Soil name	Crop rating	Range rating	Prod rating
Lp	Lawet-Davison loams, 0 to 2 percent slopes-----	35.6	57.1	57.1
LrA	Lehr-Bowdle loams, 0 to 3 percent slopes-----	37.4	23.7	37.4
LrB	Lehr-Bowdle loams, 3 to 6 percent slopes-----	32.3	22.3	32.3
Ls	Lowe loam, 0 to 1 percent slopes-----	40.0	67.9	67.9
Lt	Ludden silty clay, 0 to 1 percent slopes-----	34.9	32.1	34.9
Lu	Ludden silty clay, ponded-----	1.7	5.4	5.4
Lw	Ludden silty clay, wet, 0 to 1 percent slopes-----	18.5	32.1	32.1
M-W	Miscellaneous water-----	--	--	--
MaC	Maddock-Egeland sandy loams, 6 to 9 percent slopes-----	42.5	28.8	42.5
MdA	Max-Arnegard loams, 0 to 3 percent slopes-----	83.8	38.7	83.8
MdB	Max-Arnegard loams, 1 to 6 percent slopes-----	78.9	37.7	78.9
MgB	Max-Arnegard-Zahl loams, 1 to 6 percent slopes-----	73.1	34.9	73.1
MnB	Max-Niobell-Noonan loams, 2 to 6 percent slopes-----	60.8	28.4	60.8
MxC	Max-Zahl-Arnegard loams, 2 to 9 percent slopes-----	60.7	28.3	60.7
My	Miranda-Heil complex, 0 to 2 percent slopes-----	6.7	29.8	29.8
Mz	Moritz-Lowe loams, 0 to 2 percent slopes-----	58.3	51.9	58.3
Na	Nahon-Aberdeen-Exline silt loams, 0 to 2 percent slopes-----	43.2	24.7	43.2
Nb	Nahon-Aberdeen-Exline silt loams, till substratum, 0 to 2 percent slopes-----	43.2	24.7	43.2
Nc	Niobell-Noonan loams, 0 to 2 percent slopes-----	50.8	28.0	50.8
Nd	Niobell-Noonan-Heil complex, 0 to 2 percent slopes-----	36.5	31.1	36.5
NeA	Niobell-Noonan-Max loams, 0 to 3 percent slopes-----	55.1	28.0	55.1
Nm	Noonan-Miranda loams, 0 to 2 percent slopes-----	21.9	21.0	21.9
Nr	Northville-Farmsworth silt loams, 0 to 2 percent slopes-----	63.7	28.0	63.7
Nv	Northville-Farmsworth-Hoven silt loams, 0 to 2 percent slopes-----	41.0	31.1	41.0
Ov	Overshue fine sandy loam, 0 to 1 percent slopes-----	53.7	38.8	53.7
Pa	Parnell silty clay loam, 0 to 1 percent slopes-----	19.2	34.8	34.8
Pc	Parshall loam, 0 to 3 percent slopes-----	56.0	30.5	56.0
PeA	Peever clay loam, 0 to 2 percent slopes-----	76.4	30.5	76.4
PgB	Peever-Buse clay loams, 1 to 4 percent slopes-----	65.5	28.3	65.5
PoA	Peever-Cavour complex, 0 to 2 percent slopes-----	60.7	28.0	60.7
Pp	Pits, gravel and sand-----	--	4.3	4.3
Pr	Playmoor silty clay loam, 0 to 1 percent slopes-----	15.7	49.1	49.1
Py	Playmoor-Lamoure silty clay loams, channeled-----	6.2	44.2	44.2
Ra	Ranslo silty clay loam, 0 to 1 percent slopes-----	29.6	67.9	67.9
Re	Ranslo-Harriet loams, 0 to 2 percent slopes-----	16.3	51.8	51.8
RfA	Renshaw-Fordville loams, 0 to 2 percent slopes-----	42.7	23.9	42.7
RfB	Renshaw-Fordville loams, 2 to 6 percent slopes-----	37.3	22.3	37.3
So	Southam silty clay loam, 0 to 1 percent slopes-----	1.4	5.4	5.4
St	Stickney-Dudley silt loams, 0 to 2 percent slopes-----	56.1	28.0	56.1
Su	Stickney-Dudley-Hoven silt loams, 0 to 2 percent slopes-----	39.6	31.1	39.6
Sw	Straw loam, channeled-----	18.0	35.9	35.9
Sx	Straw loam, 0 to 2 percent slopes-----	91.4	50.5	91.4
TbE	Talmo-Ethan complex, 9 to 40 percent slopes, very stony-----	--	14.2	14.2
Te	Tetanka silt loam, 0 to 1 percent slopes-----	41.4	38.8	41.4
Tk	Toko fine sandy loam, 0 to 1 percent slopes-----	42.0	38.8	42.0
Tm	Toko fine sandy loam, wet, 0 to 1 percent slopes-----	19.5	34.8	34.8
Tn	Tonka silt loam, 0 to 1 percent slopes-----	42.0	38.8	42.0
To	Tonka-Rimlap silt loams, 0 to 1 percent slopes-----	42.2	38.8	42.2
Us	Udorthents, silty, 0 to 2 percent slopes-----	49.0	26.4	49.0
Va	Vallers-Hamerly loams, 0 to 2 percent slopes-----	27.9	57.1	57.1
VgA	Vang loam, 0 to 2 percent slopes-----	54.3	31.2	54.3
W	Water-----	--	--	--
WaA	Williams-Bowbells loams, 0 to 3 percent slopes-----	83.8	38.7	83.8
WaB	Williams-Bowbells loams, 1 to 6 percent slopes-----	78.9	37.4	78.9
WbA	Williams-Bowbells-Tonka complex, 0 to 3 percent slopes-----	69.4	37.9	69.4
WbB	Williams-Bowbells-Tonka complex, 0 to 6 percent slopes-----	66.0	37.7	66.0
WcA	Williams-Niobell loams, 0 to 3 percent slopes-----	73.2	30.6	73.2
WcB	Williams-Niobell loams, 3 to 6 percent slopes-----	68.8	29.9	68.8
WdA	Williams-Niobell-Tonka complex, 0 to 3 percent slopes-----	66.3	32.4	66.3
WhD	Williams-Vida loams, 6 to 15 percent slopes-----	42.1	28.5	42.1
WmB	Williams-Zahl-Bowbells loams, 1 to 6 percent slopes-----	73.1	32.4	73.1
WmC	Williams-Zahl-Bowbells loams, 2 to 9 percent slopes-----	60.7	28.3	60.7

Soil Productivity Ratings--Continued

Map symbol	Soil name	Crop rating	Range rating	Prod rating
Wn	Winship-Tonka silt loams, 0 to 1 percent slopes-----	60.8	46.0	60.8
Wo	Winship-Tonka silt loams, till substratum, 0 to 1 percent slopes-----	60.8	46.5	60.8
Ws	Woonsocket-Whitelake fine sandy loams, 0 to 2 percent slopes-----	57.0	27.7	57.0
Wt	Worthing silty clay loam, 0 to 1 percent slopes-----	18.5	34.8	34.8
Ww	Worthing silty clay loam, ponded-----	1.7	5.4	5.4
ZaE	Zahill loam, 15 to 40 percent slopes-----	16.3	23.3	23.3
ZbC	Zahl-Max loams, 6 to 9 percent slopes-----	50.6	27.4	50.6
ZbD	Zahl-Max loams, 9 to 20 percent slopes-----	37.6	26.4	37.6
ZgD	Zell-Great Bend silt loams, 6 to 25 percent slopes-----	48.7	26.5	48.7

Yields per Acre of Crops

(Yields are those that can be expected under a high level of management. They are for nonirrigated areas. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil.)

Map symbol and soil name	Alfalfa hay	Bromegrass- alfalfa	Corn	Soybeans	Sunflowers	Spring wheat
	<i>Tons</i>	<i>AUM</i>	<i>Bu</i>	<i>Bu</i>	<i>Lbs</i>	<i>Bu</i>
Aa:----- Aastad	3.9	4.3	112.0	41.0	1,900.0	48.0
Ab:----- Aastad Hamerly	3.8	4.0	101.0	35.0	1,600.0	39.0
Ad:----- Aastad Tonka	2.8	3.1	96.0	34.0	1,550.0	34.0
Ae:----- Aberdeen Nahon	2.6	3.0	72.0	25.0	1,250.0	32.0
Ah:----- Aberdeen Nahon	2.6	3.0	72.0	25.0	1,250.0	32.0
An:----- Aberdeen Nahon Heil	1.9	2.0	57.0	20.0	950.0	26.0
Ao:----- Aberdeen Nahon Heil	1.9	2.0	57.0	20.0	950.0	26.0
At:----- Aquents, loamy	---	---	---	---	---	---
BaC:----- Beadle	2.5	2.8	63.0	23.0	1,100.0	31.0
BdA:----- Beadle Dudley	2.9	3.1	69.0	26.0	1,250.0	34.0
BeA:----- Beadle Stickney	3.3	3.5	91.0	31.0	1,500.0	39.0
BeB:----- Beadle Stickney	3.1	3.4	84.0	29.0	1,300.0	37.0
BfA:----- Beadle, stony Stickney, stony	---	---	---	---	---	---
BfB:----- Beadle, stony Stickney, stony	---	---	---	---	---	---

Yields per Acre of Crops--Continued

Map symbol and soil name	Alfalfa hay	Bromegrass- alfalfa	Corn	Soybeans	Sunflowers	Spring wheat
	<i>Tons</i>	<i>AUM</i>	<i>Bu</i>	<i>Bu</i>	<i>Lbs</i>	<i>Bu</i>
Bg:----- Bearden	2.9	3.1	94.0	29.0	1,500.0	33.0
Bk:----- Bearden Tonka	1.9	2.4	83.0	26.0	1,400.0	29.0
Bo:----- Beotia	4.0	4.5	117.0	44.0	2,000.0	50.0
Br:----- Beotia Rondell	3.6	4.0	109.0	36.0	1,800.0	45.0
Bs:----- Beotia Winship	3.6	4.0	114.0	39.0	1,800.0	45.0
Bt:----- Beotia Winship	3.6	4.0	114.0	39.0	1,800.0	45.0
Bu:----- Bon	4.0	4.4	110.0	43.0	1,850.0	45.0
Bw:----- Bon, channeled	1.3	1.4	17.0	7.0	350.0	7.0
BxD:----- Buse Barnes	2.3	2.5	45.0	15.0	700.0	23.0
ByE:----- Buse, stony Barnes, stony	---	---	---	---	---	---
BzE:----- Buse Langhei	1.5	1.6	15.0	5.0	250.0	10.0
Ca:----- Camtown Turton	2.5	2.8	74.0	24.0	1,200.0	31.0
Cf:----- Cavour Ferney	1.0	1.1	26.0	9.0	400.0	14.0
Co:----- Colvin, saline	0.3	0.3	29.0	6.0	475.0	7.0
Cr:----- Cresbard Cavour	2.4	2.6	68.0	23.0	1,100.0	30.0
Cs:----- Cresbard Cavour Heil	1.6	1.8	48.0	16.0	800.0	21.0

Yields per Acre of Crops--Continued

Map symbol and soil name	Alfalfa hay	Bromegrass- alfalfa	Corn	Soybeans	Sunflowers	Spring wheat
	<i>Tons</i>	<i>AUM</i>	<i>Bu</i>	<i>Bu</i>	<i>Lbs</i>	<i>Bu</i>
Ct:----- Crossplain Tetonka	2.6	2.9	96.0	34.0	1,550.0	34.0
Da:----- Davis Northville	3.4	3.6	102.0	35.0	1,600.0	43.0
Db:----- Davison	2.8	2.9	87.0	26.0	1,425.0	32.0
Dd:----- Davison Tetonka	1.6	1.8	80.0	24.0	1,250.0	24.0
DeA:----- Delmont Enet	1.9	2.4	41.0	15.0	775.0	24.0
Dk:----- Dimo	2.8	3.5	90.0	31.0	1,500.0	34.0
Dm:----- Dimo Grat	2.1	2.4	80.0	28.0	1,250.0	27.0
DoA:----- Doland Embden	3.3	3.5	96.0	34.0	1,550.0	40.0
Dq:----- Dovecreek	3.9	4.3	116.0	43.0	1,850.0	45.0
Dr:----- Dovray	---	---	33.0	13.0	600.0	5.0
Du:----- Dudley Jerauld	1.0	1.1	28.0	9.0	425.0	14.0
Dx:----- Durrstein	---	---	6.0	1.0	60.0	1.0
Ea:----- Eckman	3.6	3.9	105.0	39.0	1,720.0	46.0
EcA:----- Eckman Gardena	3.8	4.1	110.0	40.0	1,850.0	48.0
EcB:----- Eckman Gardena	3.6	3.9	103.0	38.0	1,720.0	45.0
EdB:----- Eckman Zell	3.3	3.5	94.0	31.0	1,550.0	43.0
EeB:----- Edgeley	3.0	3.1	80.0	30.0	1,350.0	37.0

Yields per Acre of Crops--Continued

Map symbol and soil name	Alfalfa hay	Bromegrass- alfalfa	Corn	Soybeans	Sunflowers	Spring wheat
	<i>Tons</i>	<i>AUM</i>	<i>Bu</i>	<i>Bu</i>	<i>Lbs</i>	<i>Bu</i>
EeC:----- Edgeley	2.5	2.8	63.0	23.0	1,000.0	30.0
EeD:----- Edgeley	2.3	2.5	48.0	18.0	830.0	25.0
EgA:----- Egeland Emden	2.8	3.0	74.0	26.0	1,250.0	32.0
EgB:----- Egeland Emden	2.6	2.9	68.0	24.0	1,150.0	30.0
Ek:----- Elsmere	3.8	4.0	88.0	34.0	1,720.0	43.0
EmE:----- Ethan Betts	1.5	1.6	14.0	5.0	250.0	8.0
EnD:----- Ethan Hand	2.3	2.5	43.0	15.0	700.0	23.0
Er:----- Exline Aberdeen Nahon	1.4	1.6	39.0	13.0	600.0	19.0
Et:----- Exline Aberdeen Nahon	1.4	1.6	39.0	13.0	600.0	19.0
Ew:----- Exline Heil	0.3	0.3	12.0	3.0	120.0	5.0
Ex:----- Exline Heil	0.3	0.3	12.0	3.0	120.0	5.0
EyA:----- Exline Putney	1.8	1.9	51.0	16.0	775.0	23.0
Fa:----- Farmsworth Durrstein	0.5	0.5	23.0	8.0	350.0	7.0
Fe:----- Ferney Heil	0.3	0.3	11.0	3.0	120.0	5.0
Ff:----- Forestburg Elsmere	3.6	3.9	83.0	31.0	1,550.0	42.0

Yields per Acre of Crops--Continued

Map symbol and soil name	Alfalfa hay	Bromegrass- alfalfa	Corn	Soybeans	Sunflowers	Spring wheat
	<i>Tons</i>	<i>AUM</i>	<i>Bu</i>	<i>Bu</i>	<i>Lbs</i>	<i>Bu</i>
Fh:----- Forestburg Elsmere Toko	2.8	3.0	80.0	29.0	1,425.0	36.0
FmA:----- Forman Aastad	3.8	4.0	105.0	38.0	1,800.0	45.0
FmB:----- Forman Aastad	3.6	3.9	96.0	35.0	1,700.0	43.0
FnC:----- Forman Buse	2.6	2.9	69.0	23.0	1,100.0	31.0
FrB:----- Forman Buse Aastad	3.3	3.5	90.0	31.0	1,500.0	40.0
FrC:----- Forman Buse Aastad	2.9	3.1	76.0	25.0	1,200.0	33.0
FsA:----- Forman Cresbard	3.3	3.5	94.0	34.0	1,550.0	40.0
FsB:----- Forman Cresbard	3.1	3.4	87.0	31.0	1,425.0	38.0
FtA:----- Forman Cresbard Tonka	2.6	2.9	88.0	31.0	1,450.0	36.0
Ga:----- Gardena	3.9	4.0	114.0	43.0	1,900.0	50.0
Gd:----- Gardena Glyndon	3.5	3.8	107.0	35.0	1,700.0	42.0
Ge:----- Gardena Turton	2.8	3.0	85.0	26.0	1,425.0	33.0
GgA:----- Great Bend	3.9	4.0	107.0	39.0	1,800.0	46.0
GnA:----- Great Bend Beotia	3.9	4.1	114.0	41.0	1,900.0	48.0
GnB:----- Great Bend Beotia	3.8	4.0	106.0	39.0	1,800.0	45.0

Yields per Acre of Crops--Continued

Map symbol and soil name	Alfalfa hay	Bromegrass- alfalfa	Corn	Soybeans	Sunflowers	Spring wheat
	<i>Tons</i>	<i>AUM</i>	<i>Bu</i>	<i>Bu</i>	<i>Lbs</i>	<i>Bu</i>
GoA:----- Great Bend Beotia	3.9	4.1	114.0	41.0	1,900.0	48.0
GpA:----- Great Bend Putney	3.6	3.9	109.0	38.0	1,725.0	45.0
GpB:----- Great Bend Putney	3.5	3.8	101.0	35.0	1,700.0	43.0
GtB:----- Great Bend Zell	3.4	3.6	94.0	33.0	1,550.0	42.0
GtC:----- Great Bend Zell	2.9	3.1	77.0	26.0	1,250.0	34.0
GzC:----- Great Bend Zell Huffton	2.8	3.0	72.0	24.0	1,130.0	33.0
HaA:----- Hamerly	2.8	3.0	90.0	26.0	1,425.0	32.0
Hb:----- Hamerly Tonka	1.6	1.8	80.0	24.0	1,250.0	24.0
HcA:----- Hand Bonilla	3.6	3.9	103.0	36.0	1,700.0	44.0
HcB:----- Hand Bonilla	3.5	3.8	95.0	34.0	1,550.0	42.0
HdA:----- Hand Carthage	3.6	3.9	103.0	36.0	1,700.0	44.0
He:----- Hand Carthage Overshue	2.6	2.9	90.0	31.0	1,500.0	38.0
HfC:----- Hand Ethan	2.5	2.8	68.0	21.0	1,000.0	30.0
HgB:----- Hand Ethan Bonilla	3.3	3.5	88.0	30.0	1,425.0	40.0
HgC:----- Hand Ethan Bonilla	2.9	3.1	74.0	25.0	1,200.0	32.0

Yields per Acre of Crops--Continued

Map symbol and soil name	Alfalfa hay	Bromegrass- alfalfa	Corn	Soybeans	Sunflowers	Spring wheat
	<i>Tons</i>	<i>AUM</i>	<i>Bu</i>	<i>Bu</i>	<i>Lbs</i>	<i>Bu</i>
HhB:----- Hand Ethan Carthage	3.4	3.6	88.0	30.0	1,500.0	40.0
HjB:----- Hand Talmo	2.1	2.4	48.0	16.0	850.0	25.0
HjC:----- Hand Talmo	1.6	1.8	37.0	14.0	650.0	23.0
Hk:----- Harmony Aberdeen	3.4	3.6	101.0	36.0	1,650.0	43.0
Hm:----- Harmony Aberdeen	3.4	3.6	101.0	36.0	1,650.0	43.0
Hn:----- Harmony Beotia	3.8	4.0	112.0	40.0	1,800.0	46.0
Ho:----- Harmony Beotia	3.8	4.0	112.0	40.0	1,800.0	46.0
Hp:----- Harriet	---	---	6.0	1.0	60.0	1.0
Hr:----- Heil	---	---	6.0	1.0	60.0	1.0
HsA:----- Henkin Blendon	2.5	2.8	68.0	24.0	1,200.0	31.0
HsB:----- Henkin Blendon	2.3	2.5	61.0	21.0	1,100.0	29.0
HtB:----- Houdek Ethan Prosper	3.3	3.5	88.0	30.0	1,425.0	40.0
HtC:----- Houdek Ethan Prosper	2.9	3.1	74.0	25.0	1,200.0	32.0
HuA:----- Houdek Prosper	3.6	3.9	103.0	36.0	1,650.0	44.0
HuB:----- Houdek Prosper	3.5	3.8	95.0	34.0	1,550.0	42.0

Yields per Acre of Crops--Continued

Map symbol and soil name	Alfalfa hay	Bromegrass- alfalfa	Corn	Soybeans	Sunflowers	Spring wheat
	<i>Tons</i>	<i>AUM</i>	<i>Bu</i>	<i>Bu</i>	<i>Lbs</i>	<i>Bu</i>
HwA:----- Houdek Stickney	3.3	3.5	92.0	33.0	1,500.0	40.0
HxA:----- Houdek Stickney Tetonka	2.6	2.9	88.0	31.0	1,500.0	36.0
Hy:----- Hoven	---	---	6.0	1.0	60.0	1.0
Ie:----- Ipage Els Shue	2.5	2.8	69.0	25.0	1,200.0	32.0
Jh:----- Jerauld Hoven	0.3	0.3	11.0	3.0	125.0	5.0
KaA:----- Kranzburg Brookings	3.9	4.1	114.0	41.0	1,900.0	48.0
KbB:----- Kranzburg Brookings Buse	3.4	3.6	94.0	34.0	1,600.0	42.0
KcA:----- Kranzburg Cresbard	3.4	3.6	101.0	36.0	1,625.0	43.0
KtA:----- Kranzburg Cresbard Tonka	2.8	3.0	90.0	33.0	1,550.0	37.0
KzB:----- Kranzburg Zell Aastad	3.4	3.6	94.0	34.0	1,600.0	42.0
La:----- La Prairie	3.9	4.5	114.0	43.0	1,900.0	48.0
Lc:----- La Prairie, channeled Holmquist, channeled	0.6	0.8	10.0	4.0	200.0	5.0
Ld:----- LaDelle	4.0	4.6	117.0	44.0	2,000.0	48.0
Le:----- LaDelle, channeled	1.3	1.4	18.0	7.0	400.0	8.0
Lk:----- Lamo	1.4	1.5	76.0	26.0	1,250.0	23.0
Lm:----- Lamoure	0.6	0.9	74.0	20.0	1,130.0	21.0

Yields per Acre of Crops--Continued

Map symbol and soil name	Alfalfa hay	Bromegrass- alfalfa	Corn	Soybeans	Sunflowers	Spring wheat
	<i>Tons</i>	<i>AUM</i>	<i>Bu</i>	<i>Bu</i>	<i>Lbs</i>	<i>Bu</i>
Ln:----- Lawet	0.4	0.5	55.0	10.0	950.0	10.0
Lo:----- Lawet, wet	---	---	28.0	8.0	500.0	7.0
Lp:----- Lawet Davison	0.8	0.9	61.0	13.0	1,100.0	12.0
LrA:----- Lehr Bowdle	1.8	1.9	40.0	14.0	700.0	21.0
LrB:----- Lehr Bowdle	1.6	1.8	34.0	11.0	600.0	18.0
Ls:----- Lowe	0.6	0.8	65.0	20.0	1,000.0	17.0
Lt:----- Ludden	0.3	0.3	61.0	19.0	950.0	13.0
Lu:----- Ludden, ponded	---	---	3.0	1.0	60.0	0.0
Lw:----- Ludden, wet	---	---	34.0	13.0	500.0	5.0
M-W:----- Miscellaneous water	---	---	---	---	---	---
MaC:----- Maddock Egeland	2.1	2.4	47.0	15.0	800.0	23.0
MdA:----- Max Arnegard	3.5	3.8	101.0	35.0	1,600.0	43.0
MdB:----- Max Arnegard	3.4	3.6	94.0	33.0	1,500.0	40.0
MgB:----- Max Arnegard Zahl	3.1	3.4	87.0	29.0	1,425.0	38.0
MnB:----- Max Niobell Noonan	2.4	2.6	74.0	25.0	1,200.0	32.0
MxC:----- Max Zahl Arnegard	2.8	2.9	73.0	24.0	1,130.0	31.0
My:----- Miranda Heil	0.3	0.3	10.0	3.0	120.0	4.0

Yields per Acre of Crops--Continued

Map symbol and soil name	Alfalfa hay	Bromegrass- alfalfa	Corn	Soybeans	Sunflowers	Spring wheat
	<i>Tons</i>	<i>AUM</i>	<i>Bu</i>	<i>Bu</i>	<i>Lbs</i>	<i>Bu</i>
Mz:----- Moritz Lowe	1.9	2.1	83.0	24.0	1,300.0	27.0
Na:----- Nahon Aberdeen Exline	1.8	1.9	51.0	18.0	775.0	25.0
Nb:----- Nahon Aberdeen Exline	1.8	1.9	51.0	18.0	775.0	25.0
Nc:----- Niobell Noonan	2.1	2.4	62.0	20.0	950.0	27.0
Nd:----- Niobell Noonan Heil	1.5	1.6	41.0	15.0	700.0	20.0
NeA:----- Niobell Noonan Max	2.3	2.5	69.0	21.0	1,100.0	29.0
Nm:----- Noonan Miranda	0.9	1.0	23.0	9.0	425.0	13.0
Nr:----- Northville Farmsworth	3.4	3.6	68.0	25.0	1,200.0	30.0
Nv:----- Northville Farmsworth Hoven	1.6	1.9	47.0	18.0	830.0	21.0
Ov:----- Overshue	1.0	1.1	80.0	30.0	1,425.0	18.0
Pa:----- Parnell	---	---	34.0	13.0	570.0	5.0
Pc:----- Parshall	2.3	2.5	65.0	23.0	1,200.0	29.0
PeA:----- Peever	3.1	3.4	92.0	31.0	1,500.0	39.0
PgB:----- Peever Buse	2.8	3.0	79.0	26.0	1,250.0	34.0
PoA:----- Peever Cavour	2.5	2.8	73.0	24.0	1,200.0	32.0
Pp:----- Pits, gravel and sand	0.1	0.1	3.0	1.0	50.0	1.0

Yields per Acre of Crops--Continued

Map symbol and soil name	Alfalfa hay	Bromegrass- alfalfa	Corn	Soybeans	Sunflowers	Spring wheat
	<i>Tons</i>	<i>AUM</i>	<i>Bu</i>	<i>Bu</i>	<i>Lbs</i>	<i>Bu</i>
Pr:----- Playmoor	0.3	0.4	30.0	6.0	400.0	6.0
Py:----- Playmoor, channeled Lamoure, channeled	0.0	0.2	10.0	3.0	150.0	4.0
Ra:----- Ranslo	1.1	1.3	34.0	15.0	700.0	11.0
Re:----- Ranslo Harriet	0.5	0.6	23.0	8.0	350.0	7.0
RfA:----- Renshaw Fordville	2.0	2.3	44.0	16.0	775.0	25.0
RfB:----- Renshaw Fordville	1.9	2.1	36.0	14.0	650.0	23.0
So:----- Southam	---	---	2.0	1.0	50.0	0.0
St:----- Stickney Dudley	2.4	2.6	65.0	23.0	1,100.0	30.0
Su:----- Stickney Dudley Hoven	1.6	1.8	45.0	16.0	775.0	21.0
Sw:----- Straw, channeled	1.3	1.4	16.0	6.0	350.0	7.0
Sx:----- Straw	3.8	4.0	110.0	40.0	1,800.0	44.0
TbE:----- Talmo, stony Ethan, stony	---	---	---	---	---	---
Te:----- Tetonka	0.1	0.3	69.0	24.0	1,200.0	15.0
Tk:----- Toko	0.3	0.4	69.0	24.0	1,200.0	15.0
Tm:----- Toko, wet	---	---	34.0	13.0	600.0	5.0
Tn:----- Tonka	0.3	0.4	69.0	24.0	1,200.0	15.0
To:----- Tonka Rimlap	0.4	0.5	66.0	24.0	1,200.0	15.0
Us:----- Udorthents, silty	1.9	2.1	54.0	24.0	1,200.0	19.0

Yields per Acre of Crops--Continued

Map symbol and soil name	Alfalfa hay	Bromegrass- alfalfa	Corn	Soybeans	Sunflowers	Spring wheat
	<i>Tons</i>	<i>AUM</i>	<i>Bu</i>	<i>Bu</i>	<i>Lbs</i>	<i>Bu</i>
Va:----- Vallers Hamerly	0.8	1.0	58.0	9.0	650.0	10.0
VgA:----- Vang	2.5	2.8	52.0	21.0	1,130.0	30.0
W:----- Water	---	---	---	---	---	---
WaA:----- Williams Bowbells	3.5	3.8	101.0	35.0	1,600.0	43.0
WaB:----- Williams Bowbells	3.4	3.6	94.0	33.0	1,500.0	40.0
WbA:----- Williams Bowbells Tonka	2.6	2.9	88.0	29.0	1,425.0	34.0
WbB:----- Williams Bowbells Tonka	2.5	2.8	81.0	28.0	1,375.0	33.0
WcA:----- Williams Niobell	3.0	3.3	88.0	30.0	1,425.0	38.0
WcB:----- Williams Niobell	2.9	3.1	81.0	28.0	1,375.0	36.0
WdA:----- Williams Niobell Tonka	2.5	2.8	83.0	28.0	1,375.0	33.0
WhD:----- Williams Vida	2.3	2.5	47.0	15.0	700.0	23.0
WmB:----- Williams Zahl Bowbells	3.1	3.4	87.0	29.0	1,425.0	38.0
WmC:----- Williams Zahl Bowbells	2.8	3.0	73.0	24.0	1,130.0	31.0
Wn:----- Winship Tonka	1.3	1.4	88.0	31.0	1,425.0	27.0
Wo:----- Winship Tonka	1.3	1.4	88.0	31.0	1,425.0	27.0

Yields per Acre of Crops--Continued

Map symbol and soil name	Alfalfa hay	Bromegrass- alfalfa	Corn	Soybeans	Sunflowers	Spring wheat
	<i>Tons</i>	<i>AUM</i>	<i>Bu</i>	<i>Bu</i>	<i>Lbs</i>	<i>Bu</i>
Ws:----- Woonsocket Whitelake	2.3	2.5	68.0	23.0	1,200.0	30.0
Wt:----- Worthing	---	---	34.0	13.0	500.0	5.0
Ww:----- Worthing, ponded	---	---	3.0	1.0	60.0	0.0
ZaE:----- Zahill	1.4	1.5	11.0	4.0	250.0	8.0
ZbC:----- Zahl Max	2.4	2.6	62.0	20.0	900.0	25.0
ZbD:----- Zahl Max	2.1	2.4	41.0	14.0	650.0	18.0
ZgD:----- Zell Great Bend	2.5	2.9	53.0	18.0	850.0	26.0

Prime Farmland

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name.)

Map symbol	Soil name
Aa	Aastad loam, 0 to 2 percent slopes
Ab	Aastad-Hamerly loams, 0 to 2 percent slopes
Ad	Aastad-Tonka complex, 0 to 2 percent slopes (prime farmland if drained)
Bg	Bearden silt loam, 0 to 2 percent slopes
Bk	Bearden-Tonka silt loams, 0 to 2 percent slopes (prime farmland if drained)
Bo	Beotia silt loam, 0 to 2 percent slopes
Br	Beotia-Rondell silt loams, 0 to 3 percent slopes
Bs	Beotia-Winship silt loams, 0 to 2 percent slopes
Bt	Beotia-Winship silt loams, till substratum, 0 to 2 percent slopes
Bu	Bon loam, 0 to 2 percent slopes
Ct	Crossplain-Tetonka complex, 0 to 1 percent slopes (prime farmland if drained)
Db	Davison loam, 0 to 2 percent slopes
Dd	Davison-Tetonka complex, 0 to 2 percent slopes (prime farmland if drained)
DeA	Delmont-Enet loams, 0 to 2 percent slopes (prime farmland if irrigated)
Dk	Dimo loam, 0 to 2 percent slopes (prime farmland if irrigated)
DoA	Doland-Embden complex, 0 to 3 percent slopes
Dq	Dovecreek silt loam, 0 to 2 percent slopes
Ea	Eckman very fine sandy loam, 0 to 2 percent slopes
EcA	Eckman-Gardena very fine sandy loams, 0 to 2 percent slopes
EcB	Eckman-Gardena very fine sandy loams, 2 to 6 percent slopes
EdB	Eckman-Zell very fine sandy loams, 2 to 6 percent slopes
EeB	Edgeley loam, 2 to 6 percent slopes
EgA	Egeland-Embden complex, 0 to 2 percent slopes
EgB	Egeland-Embden complex, 2 to 6 percent slopes
FmA	Forman-Aastad loams, 0 to 3 percent slopes
FmB	Forman-Aastad loams, 1 to 6 percent slopes
FrB	Forman-Buse-Aastad loams, 1 to 6 percent slopes
Ga	Gardena very fine sandy loam, 0 to 2 percent slopes
Gd	Gardena-Glyndon silt loams, 0 to 2 percent slopes
GgA	Great Bend silt loam, 0 to 2 percent slopes
GnA	Great Bend-Beotia silt loams, 0 to 2 percent slopes
GnB	Great Bend-Beotia silt loams, 1 to 6 percent slopes
GoA	Great Bend-Beotia silt loams, till substratum, 0 to 2 percent slopes
GpA	Great Bend-Putney silt loams, 0 to 2 percent slopes
GpB	Great Bend-Putney silt loams, 2 to 4 percent slopes
GtB	Great Bend-Zell silt loams, 2 to 6 percent slopes
HaA	Hamerly loam, 0 to 2 percent slopes
Hb	Hamerly-Tonka complex, 0 to 2 percent slopes (prime farmland if drained)
HcA	Hand-Bonilla loams, 0 to 3 percent slopes (prime farmland if irrigated)
HcB	Hand-Bonilla loams, 1 to 6 percent slopes (prime farmland if irrigated)
HdA	Hand-Carthage fine sandy loams, 0 to 3 percent slopes (prime farmland if irrigated)
He	Hand-Carthage-Overshue fine sandy loams, 0 to 3 percent slopes (prime farmland if irrigated)
HgB	Hand-Ethan-Bonilla loams, 1 to 6 percent slopes (prime farmland if irrigated)
HhB	Hand-Ethan-Carthage complex, 1 to 6 percent slopes (prime farmland if irrigated)
Hn	Harmony-Beotia silt loams, 0 to 2 percent slopes
Ho	Harmony-Beotia silt loams, till substratum, 0 to 2 percent slopes
HsA	Henkin-Blendon fine sandy loams, 0 to 2 percent slopes (prime farmland if irrigated)
HsB	Henkin-Blendon fine sandy loams, 2 to 6 percent slopes (prime farmland if irrigated)
HtB	Houdek-Ethan-Prosper loams, 1 to 6 percent slopes (prime farmland if irrigated)
HuA	Houdek-Prosper loams, 0 to 2 percent slopes (prime farmland if irrigated)
HuB	Houdek-Prosper loams, 1 to 6 percent slopes (prime farmland if irrigated)
KaA	Kranzburg-Brookings silt loams, 0 to 2 percent slopes
KbB	Kranzburg-Brookings-Buse complex, 1 to 6 percent slopes
KzB	Kranzburg-Zell-Aastad complex, 1 to 6 percent slopes
La	La Prairie loam, 0 to 2 percent slopes
Ld	LaDelle silt loam, 0 to 2 percent slopes
Lk	Lamo silty clay loam, 0 to 1 percent slopes (prime farmland if drained)
Lm	Lamoure silty clay loam, 0 to 1 percent slopes (prime farmland if drained)
Ln	Lawet loam, 0 to 2 percent slopes (prime farmland if drained)
Lp	Lawet-Davison loams, 0 to 2 percent slopes (prime farmland if drained)
LrA	Lehr-Bowdle loams, 0 to 3 percent slopes (prime farmland if irrigated)

Prime Farmland--Continued

Map symbol	Soil name
LrB	Lehr-Bowdle loams, 3 to 6 percent slopes (prime farmland if irrigated)
Ls	Lowe loam, 0 to 1 percent slopes (prime farmland if drained)
Lt	Ludden silty clay, 0 to 1 percent slopes (prime farmland if drained)
MdA	Max-Arnegard loams, 0 to 3 percent slopes (prime farmland if irrigated)
MdB	Max-Arnegard loams, 1 to 6 percent slopes (prime farmland if irrigated)
MgB	Max-Arnegard-Zahl loams, 1 to 6 percent slopes (prime farmland if irrigated)
Mz	Moritz-Lowe loams, 0 to 2 percent slopes (prime farmland if drained)
Ov	Overshue fine sandy loam, 0 to 1 percent slopes (prime farmland if drained)
Pc	Parshall loam, 0 to 3 percent slopes (prime farmland if irrigated)
PeA	Peever clay loam, 0 to 2 percent slopes
PgB	Peever-Buse clay loams, 1 to 4 percent slopes
RfA	Renshaw-Fordville loams, 0 to 2 percent slopes (prime farmland if irrigated)
RfB	Renshaw-Fordville loams, 2 to 6 percent slopes (prime farmland if irrigated)
Sx	Straw loam, 0 to 2 percent slopes
Te	Tetanka silt loam, 0 to 1 percent slopes (prime farmland if drained)
Tk	Toko fine sandy loam, 0 to 1 percent slopes (prime farmland if drained)
Tn	Tonka silt loam, 0 to 1 percent slopes (prime farmland if drained)
To	Tonka-Rimlap silt loams, 0 to 1 percent slopes (prime farmland if drained)
Va	Vallers-Hamerly loams, 0 to 2 percent slopes (prime farmland if drained)
VgA	Vang loam, 0 to 2 percent slopes
WaA	Williams-Bowbells loams, 0 to 3 percent slopes (prime farmland if irrigated)
WaB	Williams-Bowbells loams, 1 to 6 percent slopes (prime farmland if irrigated)
WbA	Williams-Bowbells-Tonka complex, 0 to 3 percent slopes (prime farmland if irrigated)
WbB	Williams-Bowbells-Tonka complex, 0 to 6 percent slopes (prime farmland if irrigated)
WmB	Williams-Zahl-Bowbells loams, 1 to 6 percent slopes (prime farmland if irrigated)
Wn	Winship-Tonka silt loams, 0 to 1 percent slopes (prime farmland if drained)
Wo	Winship-Tonka silt loams, till substratum, 0 to 1 percent slopes (prime farmland if drained)

Ecological Site Productivity and Characteristic Plant Communities

(Only the soils that support rangeland vegetation suitable for grazing are rated.)

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Aa: Aastad-----	Loamy Overflow	4,800	3,800	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5
Ab: Aastad-----	Loamy Overflow	4,800	3,800	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5
Hamerly-----	Limy Subirrigated	5,500	4,000	3,000	little bluestem----- big bluestem----- green needlegrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses switchgrass----- other perennial grasslikes----- porcupinegrass----- yellow Indiangrass-----	30 15 10 10 10 10 5 5 5
Ad: Aastad-----	Loamy Overflow	4,800	3,800	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Ad: (cont.) Tonka-----	Wet Meadow	5,500	4,500	3,500	prairie cordgrass----- northern reedgrass----- clustered field sedge----- other perennial grasslikes---- woolly sedge----- fowl bluegrass----- miscellaneous perennial grasses spikerush----- switchgrass----- western wheatgrass-----	30 15 10 10 10 5 5 5 5 5
Ae: Aberdeen-----	Clayey	3,400	2,600	1,800	green needlegrass----- western wheatgrass----- big bluestem----- sideoats grama----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- sedge-----	35 20 10 10 10 5 5 5
Nahon-----	Claypan	2,600	2,000	1,400	western wheatgrass----- green needlegrass----- blue grama----- needleandthread----- sedge----- buffalograss----- miscellaneous perennial forbs-- porcupinegrass-----	30 20 15 10 10 5 5 5
Ah: Aberdeen-----	Clayey	3,400	2,600	1,800	green needlegrass----- western wheatgrass----- big bluestem----- sideoats grama----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- sedge-----	35 20 10 10 10 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Ah: (cont.) Nahon-----	Claypan	2,600	2,000	1,400	western wheatgrass----- green needlegrass----- blue grama----- needleandthread----- sedge----- buffalograss----- miscellaneous perennial forbs-- porcupinegrass-----	30 20 15 10 10 5 5 5
An: Aberdeen-----	Clayey	3,400	2,600	1,800	green needlegrass----- western wheatgrass----- big bluestem----- sideoats grama----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- sedge-----	35 20 10 10 10 5 5 5
Nahon-----	Claypan	2,600	2,000	1,400	western wheatgrass----- green needlegrass----- blue grama----- needleandthread----- sedge----- buffalograss----- miscellaneous perennial forbs-- porcupinegrass-----	30 20 15 10 10 5 5 5
Heil-----	Closed Depression	3,400	3,100	2,200	western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses inland saltgrass----- other perennial grasslikes----- sedge-----	65 10 10 5 5 5
Ao: Aberdeen-----	Clayey	3,400	2,600	1,800	green needlegrass----- western wheatgrass----- big bluestem----- sideoats grama----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- sedge-----	35 20 10 10 10 5 5 5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Ao: (cont.) Nahon-----	Claypan	2,600	2,000	1,400	western wheatgrass----- green needlegrass----- blue grama----- needleandthread----- sedge----- buffalograss----- miscellaneous perennial forbs-- porcupinegrass-----	30 20 15 10 10 5 5 5
Heil-----	Closed Depression	3,400	3,100	2,200	western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses inland saltgrass----- other perennial grasslikes---- sedge-----	65 10 10 5 5 5
At: Aquents, loamy-----	---	---	---	---	---	---
BaC: Beadle-----	Clayey	3,400	2,600	1,800	western wheatgrass----- green needlegrass----- big bluestem----- sideoats grama----- blue grama----- buffalograss----- miscellaneous perennial forbs-- porcupinegrass----- sedge-----	30 25 10 10 5 5 5 5 5
BdA: Beadle-----	Clayey	3,400	2,600	1,800	western wheatgrass----- green needlegrass----- big bluestem----- sideoats grama----- blue grama----- buffalograss----- miscellaneous perennial forbs-- porcupinegrass----- sedge-----	30 25 10 10 5 5 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
BdA: (cont.) Dudley-----	Claypan	2,600	2,000	1,400	western wheatgrass----- green needlegrass----- blue grama----- needleandthread----- miscellaneous perennial forbs-- sedge----- buffalograss-----	30 20 15 10 10 10 5
BeA: Beadle-----	Clayey	3,400	2,600	1,800	western wheatgrass----- green needlegrass----- big bluestem----- sideoats grama----- blue grama----- buffalograss----- miscellaneous perennial forbs-- porcupinegrass----- sedge-----	30 25 10 10 5 5 5 5 5
Stickney-----	Clayey	3,400	2,600	1,800	western wheatgrass----- green needlegrass----- big bluestem----- sideoats grama----- blue grama----- buffalograss----- miscellaneous perennial forbs-- porcupinegrass----- sedge-----	30 25 10 10 5 5 5 5 5
BeB: Beadle-----	Clayey	3,400	2,600	1,800	western wheatgrass----- green needlegrass----- big bluestem----- sideoats grama----- blue grama----- buffalograss----- miscellaneous perennial forbs-- porcupinegrass----- sedge-----	30 25 10 10 5 5 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
BeB: (cont.) Stickney-----	Clayey	3,400	2,600	1,800	western wheatgrass----- green needlegrass----- big bluestem----- sideoats grama----- blue grama----- buffalograss----- miscellaneous perennial forbs-- porcupinegrass----- sedge-----	30 25 10 10 5 5 5 5 5
BfA: Beadle, stony-----	Clayey	3,400	2,600	1,800	western wheatgrass----- green needlegrass----- big bluestem----- sideoats grama----- blue grama----- buffalograss----- miscellaneous perennial forbs-- porcupinegrass----- sedge-----	30 25 10 10 5 5 5 5 5
Stickney, stony-----	Clayey	3,400	2,600	1,800	western wheatgrass----- green needlegrass----- big bluestem----- sideoats grama----- blue grama----- buffalograss----- miscellaneous perennial forbs-- porcupinegrass----- sedge-----	30 25 10 10 5 5 5 5 5
BfB: Beadle, stony-----	Clayey	3,400	2,600	1,800	western wheatgrass----- green needlegrass----- big bluestem----- sideoats grama----- blue grama----- buffalograss----- miscellaneous perennial forbs-- porcupinegrass----- sedge-----	30 25 10 10 5 5 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
BfB: (cont.) Stickney, stony-----	Clayey	3,400	2,600	1,800	western wheatgrass----- green needlegrass----- big bluestem----- sideoats grama----- blue grama----- buffalograss----- miscellaneous perennial forbs-- porcupinegrass----- sedge-----	30 25 10 10 5 5 5 5 5
Bg: Bearden-----	Limy Subirrigated	5,500	4,000	3,000	little bluestem----- big bluestem----- green needlegrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses switchgrass----- other perennial grasslikes----- porcupinegrass----- yellow Indiangrass-----	30 15 10 10 10 10 5 5 5
Bk: Bearden-----	Limy Subirrigated	5,500	4,000	3,000	little bluestem----- big bluestem----- green needlegrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses switchgrass----- other perennial grasslikes----- porcupinegrass----- yellow Indiangrass-----	30 15 10 10 10 10 5 5 5
Tonka-----	Wet Meadow	5,500	4,500	3,500	prairie cordgrass----- northern reedgrass----- clustered field sedge----- other perennial grasslikes----- woolly sedge----- fowl bluegrass----- miscellaneous perennial grasses spikerush----- switchgrass----- western wheatgrass-----	30 15 10 10 10 5 5 5 5 5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Bo: Beotia-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5 5
Br: Beotia-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5 5
Rondell-----	Limy Subirrigated	5,500	4,000	3,000	little bluestem----- big bluestem----- green needlegrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses switchgrass----- other perennial grasslikes----- porcupinegrass----- yellow Indiangrass-----	30 15 10 10 10 10 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Bs: Beotia-----	Loamy Overflow	4,800	3,800	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5
Winship-----	Loamy Overflow	4,800	3,800	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5
Bt: Beotia-----	Loamy Overflow	4,800	3,800	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5
Winship-----	Loamy Overflow	4,800	3,800	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Bu: Bon-----	Loamy	4,800	3,800	2,800	green needlegrass----- big bluestem----- western wheatgrass----- needleandthread----- porcupinegrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama----- slender wheatgrass-----	20 15 15 10 10 5 5 5 5 5
Bw: Bon, channeled-----	Loamy Overflow	4,800	3,800	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5
ExD: Buse-----	Thin Loamy	3,400	2,200	1,400	little bluestem----- porcupinegrass----- green needlegrass----- needleandthread----- big bluestem----- blue grama----- miscellaneous perennial forbs-- sedge----- sideoats grama----- western wheatgrass-----	25 25 10 10 5 5 5 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
BxD: (cont.) Barnes-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5 5
ByE: Buse, stony-----	Thin Loamy	3,400	2,200	1,400	little bluestem----- porcupinegrass----- green needlegrass----- needleandthread----- big bluestem----- blue grama----- miscellaneous perennial forbs-- sedge----- sideoats grama----- western wheatgrass-----	25 25 10 10 5 5 5 5 5 5
Barnes, stony-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5 5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
BzE:						
Buse-----	Thin Loamy	3,400	2,200	1,400	little bluestem-----	25
					porcupinegrass-----	25
					green needlegrass-----	10
					needleandthread-----	10
					big bluestem-----	5
					blue grama-----	5
					miscellaneous perennial forbs--	5
					sedge-----	5
					sideoats grama-----	5
					western wheatgrass-----	5
Langhei-----	Thin Loamy	3,400	2,200	1,400	little bluestem-----	25
					porcupinegrass-----	25
					green needlegrass-----	10
					needleandthread-----	10
					big bluestem-----	5
					blue grama-----	5
					miscellaneous perennial forbs--	5
					sedge-----	5
					sideoats grama-----	5
					western wheatgrass-----	5
Ca:						
Camtown-----	Clayey	3,400	2,600	1,800	green needlegrass-----	35
					western wheatgrass-----	20
					big bluestem-----	10
					sideoats grama-----	10
					slender wheatgrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					sedge-----	5
Turton-----	Claypan	2,600	2,000	1,400	western wheatgrass-----	30
					green needlegrass-----	20
					blue grama-----	15
					needleandthread-----	10
					sedge-----	10
					buffalograss-----	5
					miscellaneous perennial forbs--	5
					porcupinegrass-----	5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Cf: Cavour-----	Claypan	2,600	2,000	1,400	western wheatgrass-----	30
					green needlegrass-----	20
					blue grama-----	15
					needleandthread-----	10
					sedge-----	10
					buffalograss-----	5
					miscellaneous perennial forbs--	5
					porcupinegrass-----	5
Ferney-----	Thin Claypan	1,800	1,300	800	western wheatgrass-----	45
					blue grama-----	20
					Nuttall's alkaligrass-----	5
					buffalograss-----	5
					inland saltgrass-----	5
					needleandthread-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
Co: Colvin, saline-----	Saline Subirrigated	5,600	4,400	3,500	sedge-----	5
					big bluestem-----	25
					switchgrass-----	15
					little bluestem-----	10
					prairie cordgrass-----	10
					western wheatgrass-----	10
					yellow Indiangrass-----	10
					alkali sacaton-----	5
Cr: Cresbard-----	Clayey	3,400	2,600	1,800	miscellaneous perennial forbs--	5
					saltgrass-----	5
					sedge-----	5
					green needlegrass-----	35
					western wheatgrass-----	20
					big bluestem-----	10
					sideoats grama-----	10
					slender wheatgrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					sedge-----	5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Cr: (cont.) Cavour-----	Claypan	2,600	2,000	1,400	western wheatgrass----- green needlegrass----- blue grama----- needleandthread----- sedge----- buffalograss----- miscellaneous perennial forbs-- porcupinegrass-----	30 20 15 10 10 5 5 5
Cs: Cresbard-----	Clayey	3,400	2,600	1,800	green needlegrass----- western wheatgrass----- big bluestem----- sideoats grama----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- sedge-----	35 20 10 10 10 5 5 5
Cavour-----	Claypan	2,600	2,000	1,400	western wheatgrass----- green needlegrass----- blue grama----- needleandthread----- sedge----- buffalograss----- miscellaneous perennial forbs-- porcupinegrass-----	30 20 15 10 10 5 5 5
Heil-----	Closed Depression	3,400	3,100	2,200	western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses inland saltgrass----- other perennial grasslikes----- sedge-----	65 10 10 5 5 5
Ct: Crossplain-----	Loamy Overflow	4,800	3,800	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Ct: (cont.) Tetonka-----	Wet Meadow	5,000	4,200	3,500	prairie cordgrass----- northern reedgrass----- other perennial grasslikes----- slough sedge----- woolly sedge----- clustered field sedge----- miscellaneous perennial forbs-- miscellaneous perennial grasses switchgrass-----	25 20 10 10 10 5 5 5 5
Da: Davis-----	Loamy Overflow	4,800	3,800	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5
Northville-----	Clayey	3,400	2,600	1,800	western wheatgrass----- green needlegrass----- big bluestem----- sideoats grama----- blue grama----- buffalograss----- miscellaneous perennial forbs-- porcupinegrass----- sedge-----	30 25 10 10 5 5 5 5 5
Db: Davison-----	Limy Subirrigated	5,500	4,000	3,000	little bluestem----- big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge-----	25 15 10 10 10 10 5 5 5 5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Dd: Davison-----	Limy Subirrigated	5,500	4,000	3,000	little bluestem-----	25
					big bluestem-----	15
					green needlegrass-----	10
					porcupinegrass-----	10
					switchgrass-----	10
					western wheatgrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					sedge-----	5
Tetonka-----	Wet Meadow	5,000	4,200	3,500	prairie cordgrass-----	25
					northern reedgrass-----	20
					other perennial grasslikes----	10
					slough sedge-----	10
					woolly sedge-----	10
					clustered field sedge-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					switchgrass-----	5
DeA: Delmont-----	Shallow To Gravel	2,500	1,900	1,100	needleandthread-----	35
					green needlegrass-----	10
					miscellaneous perennial forbs--	10
					miscellaneous perennial grasses	10
					threadleaf sedge-----	10
					blue grama-----	5
					little bluestem-----	5
					plains muhly-----	5
					porcupinegrass-----	5
					prairie dropseed-----	5
Enet-----	Loamy	3,600	2,800	1,600	green needlegrass-----	20
					big bluestem-----	15
					western wheatgrass-----	15
					needleandthread-----	10
					porcupinegrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					sedge-----	5
					sideoats grama-----	5
					slender wheatgrass-----	5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Dk: Dimo-----	Loamy Overflow	4,800	3,800	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5
Dm: Dimo-----	Loamy Overflow	4,800	3,800	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5
Grat-----	Wet Meadow	5,000	4,200	3,500	prairie cordgrass----- northern reedgrass----- other perennial grasslikes----- slough sedge----- woolly sedge----- clustered field sedge----- miscellaneous perennial forbs-- miscellaneous perennial grasses switchgrass-----	25 20 10 10 10 5 5 5 5
DoA: Doland-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
DoA: (cont.) Embden-----	Sandy	3,600	2,800	1,900	prairie sandreed----- big bluestem----- little bluestem----- needleandthread----- porcupinegrass----- sedge----- blue grama----- green needlegrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	20 15 10 10 10 10 5 5 5 5 5
Dq: Dovecreek-----	Loamy Overflow	4,300	3,500	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5
Dr: Dovray-----	Shallow Marsh	7,400	6,400	5,400	common rivergrass----- slough sedge----- American mannagrass----- common spikerush----- prairie cordgrass----- northern reedgrass----- miscellaneous perennial forbs-- other perennial grasslikes----- sedge-----	25 25 10 10 10 5 5 5 5
Du: Dudley-----	Claypan	2,600	2,000	1,400	western wheatgrass----- green needlegrass----- blue grama----- needleandthread----- miscellaneous perennial forbs-- sedge----- buffalograss-----	30 20 15 10 10 10 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Du: (cont.) Jerauld-----	Thin Claypan	1,800	1,300	800	western wheatgrass----- blue grama----- sedge----- buffalograss----- inland saltgrass----- needleleaf sedge----- miscellaneous perennial forbs-- miscellaneous shrubs-----	45 20 10 5 5 5 5 5
Dx: Durrstein-----	Saline Lowland	4,800	3,800	2,800	alkali cordgrass----- prairie cordgrass----- slender wheatgrass----- western wheatgrass----- Nuttall's alkaligrass----- inland saltgrass----- miscellaneous perennial forbs--	20 20 20 20 10 5 5
Ea: Eckman-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
EcA: Eckman-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5 5
Gardena-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5 5
EcB: Eckman-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5 5

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
EcB: (cont.) Gardena-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5 5
EdB: Eckman-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5 5
Zell-----	Thin Loamy	3,400	2,200	1,400	little bluestem----- porcupinegrass----- green needlegrass----- needleandthread----- big bluestem----- blue grama----- miscellaneous perennial forbs-- sedge----- sideoats grama----- western wheatgrass-----	25 25 10 10 5 5 5 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
EeB: Edgeley-----	Loamy	3,600	2,800	1,600	green needlegrass-----	20
					western wheatgrass-----	15
					needleandthread-----	10
					porcupinegrass-----	10
					slender wheatgrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					other perennial grasslikes-----	5
					miscellaneous shrubs-----	5
					sideoats grama-----	5
					slender wheatgrass-----	5
EeC: Edgeley-----	Loamy	3,600	2,800	1,600	green needlegrass-----	20
					western wheatgrass-----	15
					needleandthread-----	10
					porcupinegrass-----	10
					slender wheatgrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					other perennial grasslikes-----	5
					miscellaneous shrubs-----	5
					sideoats grama-----	5
					slender wheatgrass-----	5
EeD: Edgeley-----	Loamy	3,600	2,800	1,600	green needlegrass-----	20
					western wheatgrass-----	15
					needleandthread-----	10
					porcupinegrass-----	10
					slender wheatgrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					other perennial grasslikes-----	5
					miscellaneous shrubs-----	5
					sideoats grama-----	5
					slender wheatgrass-----	5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
EgA: Egeland-----	Sandy	3,600	2,800	1,900	prairie sandreed-----	20
					big bluestem-----	15
					little bluestem-----	10
					needleandthread-----	10
					porcupinegrass-----	10
					sedge-----	10
					blue grama-----	5
					green needlegrass-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
Embdn-----	Sandy	3,600	2,800	1,900	prairie sandreed-----	20
					big bluestem-----	15
					little bluestem-----	10
					needleandthread-----	10
					porcupinegrass-----	10
					sedge-----	10
					blue grama-----	5
					green needlegrass-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
EgB: Egeland-----	Sandy	3,600	2,800	1,900	prairie sandreed-----	20
					big bluestem-----	15
					little bluestem-----	10
					needleandthread-----	10
					porcupinegrass-----	10
					sedge-----	10
					blue grama-----	5
					green needlegrass-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
EgB: (cont.) Embdn-----	Sandy	3,600	2,800	1,900	prairie sandreed----- big bluestem----- little bluestem----- needleandthread----- porcupinegrass----- sedge----- blue grama----- green needlegrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	20 15 10 10 10 10 5 5 5 5 5
Ek: Elsmere-----	Subirrigated	6,200	5,000	3,800	big bluestem----- switchgrass----- northern reedgrass----- sedge----- yellow Indiangrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses prairie cordgrass-----	40 15 10 10 10 5 5 5
EmE: Ethan-----	Thin Upland	3,200	2,400	1,600	little bluestem----- porcupinegrass----- green needlegrass----- needleandthread----- sideoats grama----- big bluestem----- miscellaneous perennial forbs-- miscellaneous shrubs----- prairie sandreed----- western wheatgrass-----	30 15 10 10 10 5 5 5 5 5
Betts-----	Thin Upland	3,200	2,400	1,600	little bluestem----- porcupinegrass----- green needlegrass----- needleandthread----- sideoats grama----- big bluestem----- miscellaneous perennial forbs-- miscellaneous shrubs----- prairie sandreed----- western wheatgrass-----	30 15 10 10 10 5 5 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
EnD: Ethan-----	Thin Upland	3,200	2,400	1,600	little bluestem----- porcupinegrass----- green needlegrass----- needleandthread----- sideoats grama----- big bluestem----- miscellaneous perennial forbs-- miscellaneous shrubs----- prairie sandreed----- western wheatgrass-----	30 15 10 10 10 5 5 5 5 5
Hand-----	Loamy	3,600	2,800	1,600	green needlegrass----- big bluestem----- western wheatgrass----- needleandthread----- porcupinegrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama----- slender wheatgrass-----	20 15 15 10 10 5 5 5 5 5 5
Er: Exline-----	Thin Claypan	1,800	1,300	800	western wheatgrass----- blue grama----- Nuttall's alkaligrass----- buffalograss----- inland saltgrass----- needleandthread----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge-----	45 20 5 5 5 5 5 5 5
Aberdeen-----	Clayey	3,400	2,600	1,800	green needlegrass----- western wheatgrass----- big bluestem----- sideoats grama----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- sedge-----	35 20 10 10 10 5 5 5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Er: (cont.) Nahon-----	Claypan	2,600	2,000	1,400	western wheatgrass----- green needlegrass----- blue grama----- needleandthread----- sedge----- buffalograss----- miscellaneous perennial forbs-- porcupinegrass-----	30 20 15 10 10 5 5 5
Et: Exline-----	Thin Claypan	1,800	1,300	800	western wheatgrass----- blue grama----- Nuttall's alkaligrass----- buffalograss----- inland saltgrass----- needleandthread----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge-----	45 20 5 5 5 5 5 5 5
Aberdeen-----	Clayey	3,400	2,600	1,800	green needlegrass----- western wheatgrass----- big bluestem----- sideoats grama----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- sedge-----	35 20 10 10 10 5 5 5
Nahon-----	Claypan	2,600	2,000	1,400	western wheatgrass----- green needlegrass----- blue grama----- needleandthread----- sedge----- buffalograss----- miscellaneous perennial forbs-- porcupinegrass-----	30 20 15 10 10 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Ew:						
Exline-----	Thin Claypan	1,800	1,300	800	western wheatgrass-----	45
					blue grama-----	20
					Nuttall's alkaligrass-----	5
					buffalograss-----	5
					inland saltgrass-----	5
					needleandthread-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					sedge-----	5
Heil-----	Closed Depression	3,400	3,100	2,200	western wheatgrass-----	65
					miscellaneous perennial forbs--	10
					miscellaneous perennial grasses	10
					inland saltgrass-----	5
					other perennial grasslikes-----	5
					sedge-----	5
Ex:						
Exline-----	Thin Claypan	1,800	1,300	800	western wheatgrass-----	45
					blue grama-----	20
					Nuttall's alkaligrass-----	5
					buffalograss-----	5
					inland saltgrass-----	5
					needleandthread-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					sedge-----	5
Heil-----	Closed Depression	3,400	3,100	2,200	western wheatgrass-----	65
					miscellaneous perennial forbs--	10
					miscellaneous perennial grasses	10
					inland saltgrass-----	5
					other perennial grasslikes-----	5
					sedge-----	5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
EyA: Exline-----	Thin Claypan	1,800	1,300	800	western wheatgrass-----	45
					blue grama-----	20
					Nuttall's alkaligrass-----	5
					buffalograss-----	5
					inland saltgrass-----	5
					needleandthread-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					sedge-----	5
Putney-----	Loamy	3,600	2,800	1,600	green needlegrass-----	20
					western wheatgrass-----	15
					needleandthread-----	10
					porcupinegrass-----	10
					slender wheatgrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					other perennial grasslikes----	5
					miscellaneous shrubs-----	5
					sideoats grama-----	5
					slender wheatgrass-----	5
Fa: Farmsworth-----	Claypan	2,600	2,000	1,400	western wheatgrass-----	30
					green needlegrass-----	20
					blue grama-----	15
					needleandthread-----	10
					miscellaneous perennial forbs--	10
					sedge-----	10
					buffalograss-----	5
Durrstein-----	Saline Lowland	4,800	3,800	2,800	alkali cordgrass-----	20
					prairie cordgrass-----	20
					slender wheatgrass-----	20
					western wheatgrass-----	20
					Nuttall's alkaligrass-----	10
					inland saltgrass-----	5
					miscellaneous perennial forbs--	5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Fe: Ferney-----	Thin Claypan	1,800	1,300	800	western wheatgrass-----	45
					blue grama-----	20
					Nuttall's alkaligrass-----	5
					buffalograss-----	5
					inland saltgrass-----	5
					needleandthread-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
Heil-----	Closed Depression	3,400	3,100	2,200	sedge-----	5
					western wheatgrass-----	65
					miscellaneous perennial forbs--	10
					miscellaneous perennial grasses	10
					inland saltgrass-----	5
					other perennial grasslikes-----	5
Ff: Forestburg-----	Sandy	3,600	2,800	2,000	sedge-----	5
					big bluestem-----	15
					little bluestem-----	15
					prairie sandreed-----	15
					needleandthread-----	10
					porcupinegrass-----	10
					sand bluestem-----	10
					sideoats grama-----	10
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
Elsmere-----	Subirrigated	6,200	5,000	3,800	sedge-----	5
					big bluestem-----	40
					switchgrass-----	15
					northern reedgrass-----	10
					sedge-----	10
					yellow Indiangrass-----	10
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					prairie cordgrass-----	5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Fh: Forestburg-----	Sandy	3,600	2,800	2,000	big bluestem-----	15
					little bluestem-----	15
					prairie sandreed-----	15
					needleandthread-----	10
					porcupinegrass-----	10
					sand bluestem-----	10
					sideoats grama-----	10
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					sedge-----	5
Elsmere-----	Subirrigated	6,200	5,000	3,800	big bluestem-----	40
					switchgrass-----	15
					northern reedgrass-----	10
					sedge-----	10
					yellow Indiangrass-----	10
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					prairie cordgrass-----	5
Toko-----	Wet Meadow	5,000	4,200	3,500	prairie cordgrass-----	25
					northern reedgrass-----	20
					other perennial grasslikes-----	10
					slough sedge-----	10
					woolly sedge-----	10
					clustered field sedge-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					switchgrass-----	5
FmA: Forman-----	Loamy	3,600	2,800	1,600	green needlegrass-----	20
					western wheatgrass-----	15
					needleandthread-----	10
					porcupinegrass-----	10
					slender wheatgrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					other perennial grasslikes-----	5
					miscellaneous shrubs-----	5
					sideoats grama-----	5
					slender wheatgrass-----	5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
FmA: (cont.) Aastad-----	Loamy Overflow	4,800	3,800	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5
FmB: Forman-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5
Aastad-----	Loamy Overflow	4,800	3,800	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
FnC: Forman-----	Loamy	3,600	2,800	1,600	green needlegrass-----	20
					western wheatgrass-----	15
					needleandthread-----	10
					porcupinegrass-----	10
					slender wheatgrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					other perennial grasslikes-----	5
					miscellaneous shrubs-----	5
					sideoats grama-----	5
					slender wheatgrass-----	5
Buse-----	Thin Loamy	3,400	2,200	1,400	little bluestem-----	25
					porcupinegrass-----	25
					green needlegrass-----	10
					needleandthread-----	10
					big bluestem-----	5
					blue grama-----	5
					miscellaneous perennial forbs--	5
					sedge-----	5
					sideoats grama-----	5
					western wheatgrass-----	5
FrB: Forman-----	Loamy	3,600	2,800	1,600	green needlegrass-----	20
					western wheatgrass-----	15
					needleandthread-----	10
					porcupinegrass-----	10
					slender wheatgrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					other perennial grasslikes-----	5
					miscellaneous shrubs-----	5
					sideoats grama-----	5
					slender wheatgrass-----	5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
FrB: (cont.) Buse-----	Thin Loamy	3,400	2,200	1,400	little bluestem----- porcupinegrass----- green needlegrass----- needleandthread----- big bluestem----- blue grama----- miscellaneous perennial forbs-- sedge----- sideoats grama----- western wheatgrass-----	25 25 10 10 5 5 5 5 5 5
Aastad-----	Loamy Overflow	4,800	3,800	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5
FrC: Forman-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5 5
Buse-----	Thin Loamy	3,400	2,200	1,400	little bluestem----- porcupinegrass----- green needlegrass----- needleandthread----- big bluestem----- blue grama----- miscellaneous perennial forbs-- sedge----- sideoats grama----- western wheatgrass-----	25 25 10 10 5 5 5 5 5 5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
FrC: (cont.) Aastad-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5 5
FsA: Forman-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5 5
Cresbard-----	Clayey	3,400	2,600	1,800	green needlegrass----- western wheatgrass----- big bluestem----- sideoats grama----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- sedge-----	35 20 10 10 10 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
FsB: Forman-----	Loamy	3,600	2,800	1,600	green needlegrass-----	20
					western wheatgrass-----	15
					needleandthread-----	10
					porcupinegrass-----	10
					slender wheatgrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					other perennial grasslikes-----	5
					miscellaneous shrubs-----	5
					sideoats grama-----	5
					slender wheatgrass-----	5
Cresbard-----	Clayey	3,400	2,600	1,800	green needlegrass-----	35
					western wheatgrass-----	20
					big bluestem-----	10
					sideoats grama-----	10
					slender wheatgrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					sedge-----	5
FtA: Forman-----	Loamy	3,600	2,800	1,600	green needlegrass-----	20
					western wheatgrass-----	15
					needleandthread-----	10
					porcupinegrass-----	10
					slender wheatgrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					other perennial grasslikes-----	5
					miscellaneous shrubs-----	5
					sideoats grama-----	5
					slender wheatgrass-----	5
Cresbard-----	Clayey	3,400	2,600	1,800	green needlegrass-----	35
					western wheatgrass-----	20
					big bluestem-----	10
					sideoats grama-----	10
					slender wheatgrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					sedge-----	5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
FtA: (cont.) Tonka-----	Wet Meadow	5,500	4,500	3,500	prairie cordgrass----- northern reedgrass----- clustered field sedge----- other perennial grasslikes---- woolly sedge----- fowl bluegrass----- miscellaneous perennial grasses spikerush----- switchgrass----- western wheatgrass-----	30 15 10 10 10 5 5 5 5 5
Ga: Gardena-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes---- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5
Gd: Gardena-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes---- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Gd: (cont.) Glyndon-----	Limy Subirrigated	5,500	4,000	3,000	little bluestem----- big bluestem----- green needlegrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses switchgrass----- other perennial grasslikes----- porcupinegrass----- yellow Indiangrass-----	30 15 10 10 10 10 5 5 5
Ge: Gardena-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5 5
Turton-----	Claypan	2,600	2,000	1,400	western wheatgrass----- green needlegrass----- blue grama----- needleandthread----- sedge----- buffalograss----- miscellaneous perennial forbs-- porcupinegrass-----	30 20 15 10 10 5 5 5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
GgA: Great Bend-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5 5
GnA: Great Bend-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5 5
Beotia-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
GnB: Great Bend-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5 5
Beotia-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5 5
GoA: Great Bend-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5 5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
GoA: (cont.) Beotia-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5 5
GpA: Great Bend-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5 5
Putney-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
GpB: Great Bend-----	Loamy	3,600	2,800	1,600	green needlegrass-----	20
					western wheatgrass-----	15
					needleandthread-----	10
					porcupinegrass-----	10
					slender wheatgrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					other perennial grasslikes-----	5
					miscellaneous shrubs-----	5
					sideoats grama-----	5
					slender wheatgrass-----	5
Putney-----	Loamy	3,600	2,800	1,600	green needlegrass-----	20
					western wheatgrass-----	15
					needleandthread-----	10
					porcupinegrass-----	10
					slender wheatgrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					other perennial grasslikes-----	5
					miscellaneous shrubs-----	5
					sideoats grama-----	5
					slender wheatgrass-----	5
GtB: Great Bend-----	Loamy	3,600	2,800	1,600	green needlegrass-----	20
					western wheatgrass-----	15
					needleandthread-----	10
					porcupinegrass-----	10
					slender wheatgrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					other perennial grasslikes-----	5
					miscellaneous shrubs-----	5
					sideoats grama-----	5
					slender wheatgrass-----	5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
GtB: (cont.) Zell-----	Thin Loamy	3,400	2,200	1,400	little bluestem----- porcupinegrass----- green needlegrass----- needleandthread----- big bluestem----- blue grama----- miscellaneous perennial forbs-- sedge----- sideoats grama----- western wheatgrass-----	25 25 10 10 5 5 5 5 5 5
GtC: Great Bend-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5
Zell-----	Thin Loamy	3,400	2,200	1,400	little bluestem----- porcupinegrass----- green needlegrass----- needleandthread----- big bluestem----- blue grama----- miscellaneous perennial forbs-- sedge----- sideoats grama----- western wheatgrass-----	25 25 10 10 5 5 5 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
GzC: Great Bend-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5 5
Zell-----	Thin Loamy	3,400	2,200	1,400	little bluestem----- porcupinegrass----- green needlegrass----- needleandthread----- big bluestem----- blue grama----- miscellaneous perennial forbs-- sedge----- sideoats grama----- western wheatgrass-----	25 25 10 10 5 5 5 5 5 5
Huffton-----	Thin Loamy	3,400	2,200	1,400	little bluestem----- porcupinegrass----- green needlegrass----- needleandthread----- big bluestem----- blue grama----- miscellaneous perennial forbs-- sedge----- sideoats grama----- western wheatgrass-----	25 25 10 10 5 5 5 5 5 5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
HaA: Hamerly-----	Limy Subirrigated	5,500	4,000	3,000	little bluestem-----	30
					big bluestem-----	15
					green needlegrass-----	10
					miscellaneous perennial forbs--	10
					miscellaneous perennial grasses	10
					switchgrass-----	10
					other perennial grasslikes-----	5
					porcupinegrass-----	5
					yellow Indiangrass-----	5
Hb: Hamerly-----	Limy Subirrigated	5,500	4,000	3,000	little bluestem-----	30
					big bluestem-----	15
					green needlegrass-----	10
					miscellaneous perennial forbs--	10
					miscellaneous perennial grasses	10
					switchgrass-----	10
					other perennial grasslikes-----	5
					porcupinegrass-----	5
					yellow Indiangrass-----	5
Tonka-----	Wet Meadow	5,500	4,500	3,500	prairie cordgrass-----	30
					northern reedgrass-----	15
					clustered field sedge-----	10
					other perennial grasslikes-----	10
					woolly sedge-----	10
					fowl bluegrass-----	5
					miscellaneous perennial grasses	5
					spikerush-----	5
					switchgrass-----	5
HcA: Hand-----	Loamy	3,600	2,800	1,600	western wheatgrass-----	5
					green needlegrass-----	20
					big bluestem-----	15
					western wheatgrass-----	15
					needleandthread-----	10
					porcupinegrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					sedge-----	5
					sideoats grama-----	5
					slender wheatgrass-----	5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
HcA: (cont.) Bonilla-----	Loamy Overflow	4,800	3,800	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5
HcB: Hand-----	Loamy	3,600	2,800	1,600	green needlegrass----- big bluestem----- western wheatgrass----- needleandthread----- porcupinegrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama----- slender wheatgrass-----	20 15 15 10 10 5 5 5 5 5 5
Bonilla-----	Loamy Overflow	4,800	3,800	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5
HdA: Hand-----	Sandy	3,600	2,800	1,600	big bluestem----- little bluestem----- prairie sandreed----- needleandthread----- porcupinegrass----- sand bluestem----- sideoats grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge-----	15 15 15 10 10 10 10 5 5 5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
HdA: (cont.) Carthage-----	Sandy	3,600	2,800	2,000	big bluestem----- little bluestem----- prairie sandreed----- needleandthread----- porcupinegrass----- sand bluestem----- sideoats grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge-----	15 15 15 10 10 10 10 5 5 5
He: Hand-----	Sandy	3,600	2,800	1,600	big bluestem----- little bluestem----- prairie sandreed----- needleandthread----- porcupinegrass----- sand bluestem----- sideoats grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge-----	15 15 15 10 10 10 10 5 5 5
Carthage-----	Sandy	3,600	2,800	2,000	big bluestem----- little bluestem----- prairie sandreed----- needleandthread----- porcupinegrass----- sand bluestem----- sideoats grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge-----	15 15 15 10 10 10 10 5 5 5
Overshue-----	Wet Meadow	5,000	4,200	3,500	prairie cordgrass----- northern reedgrass----- other perennial grasslikes----- slough sedge----- woolly sedge----- clustered field sedge----- miscellaneous perennial forbs-- miscellaneous perennial grasses switchgrass-----	25 20 10 10 10 5 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
HfC: Hand-----	Loamy	3,600	2,800	1,600	green needlegrass-----	20
					big bluestem-----	15
					western wheatgrass-----	15
					needleandthread-----	10
					porcupinegrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					sedge-----	5
					sideoats grama-----	5
Ethan-----	Thin Upland	3,200	2,400	1,600	slender wheatgrass-----	5
					little bluestem-----	30
					porcupinegrass-----	15
					green needlegrass-----	10
					needleandthread-----	10
					sideoats grama-----	10
					big bluestem-----	5
					miscellaneous perennial forbs--	5
					miscellaneous shrubs-----	5
					prairie sandreed-----	5
HgB: Hand-----	Loamy	3,600	2,800	1,600	western wheatgrass-----	5
					green needlegrass-----	20
					big bluestem-----	15
					western wheatgrass-----	15
					needleandthread-----	10
					porcupinegrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					sedge-----	5
					sideoats grama-----	5
					slender wheatgrass-----	5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
HgB: (cont.) Ethan-----	Thin Upland	3,200	2,400	1,600	little bluestem----- porcupinegrass----- green needlegrass----- needleandthread----- sideoats grama----- big bluestem----- miscellaneous perennial forbs-- miscellaneous shrubs----- prairie sandreed----- western wheatgrass-----	30 15 10 10 10 5 5 5 5 5
Bonilla-----	Loamy Overflow	4,800	3,800	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5
HgC: Hand-----	Loamy	3,600	2,800	1,600	green needlegrass----- big bluestem----- western wheatgrass----- needleandthread----- porcupinegrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama----- slender wheatgrass-----	20 15 15 10 10 5 5 5 5 5 5
Ethan-----	Thin Upland	3,200	2,400	1,600	little bluestem----- porcupinegrass----- green needlegrass----- needleandthread----- sideoats grama----- big bluestem----- miscellaneous perennial forbs-- miscellaneous shrubs----- prairie sandreed----- western wheatgrass-----	30 15 10 10 10 5 5 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
HgC: (cont.) Bonilla-----	Loamy	3,600	2,800	1,600	green needlegrass----- big bluestem----- western wheatgrass----- needleandthread----- porcupinegrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama----- slender wheatgrass-----	20 15 15 10 10 5 5 5 5 5 5
HhB: Hand-----	Sandy	3,600	2,800	1,600	big bluestem----- little bluestem----- prairie sandreed----- needleandthread----- porcupinegrass----- sand bluestem----- sideoats grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge-----	15 15 15 10 10 10 10 5 5 5
Ethan-----	Thin Upland	3,200	2,400	1,600	little bluestem----- porcupinegrass----- green needlegrass----- needleandthread----- sideoats grama----- big bluestem----- miscellaneous perennial forbs-- miscellaneous shrubs----- prairie sandreed----- western wheatgrass-----	30 15 10 10 10 5 5 5 5 5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
HhB: (cont.) Carthage-----	Sandy	3,600	2,800	2,000	big bluestem----- little bluestem----- prairie sandreed----- needleandthread----- porcupinegrass----- sand bluestem----- sideoats grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge-----	15 15 15 10 10 10 10 5 5 5
HjB: Hand-----	Loamy	3,600	2,800	1,600	green needlegrass----- big bluestem----- western wheatgrass----- needleandthread----- porcupinegrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama----- slender wheatgrass-----	20 15 15 10 10 5 5 5 5 5
Talmo-----	Very Shallow	2,000	1,500	900	needleandthread----- miscellaneous perennial forbs-- threadleaf sedge----- blue grama----- miscellaneous perennial grasses western wheatgrass----- plains muhly-----	30 20 15 10 10 10 5
HjC: Hand-----	Loamy	3,600	2,800	1,600	green needlegrass----- big bluestem----- western wheatgrass----- needleandthread----- porcupinegrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama----- slender wheatgrass-----	20 15 15 10 10 5 5 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
HjC: (cont.) Talmo-----	Very Shallow	2,000	1,500	900	needleandthread----- miscellaneous perennial forbs-- threadleaf sedge----- blue grama----- miscellaneous perennial grasses western wheatgrass----- plains muhly-----	30 20 15 10 10 10 5
Hk: Harmony-----	Clayey	3,400	2,600	1,800	green needlegrass----- western wheatgrass----- big bluestem----- sideoats grama----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- sedge-----	35 20 10 10 10 5 5 5
Aberdeen-----	Clayey	3,400	2,600	1,800	green needlegrass----- western wheatgrass----- big bluestem----- sideoats grama----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- sedge-----	35 20 10 10 10 5 5 5
Hm: Harmony-----	Clayey	3,400	2,600	1,800	green needlegrass----- western wheatgrass----- big bluestem----- sideoats grama----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- sedge-----	35 20 10 10 10 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Hm: (cont.) Aberdeen-----	Clayey	3,400	2,600	1,800	green needlegrass----- western wheatgrass----- big bluestem----- sideoats grama----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- sedge-----	35 20 10 10 10 5 5 5
Hn: Harmony-----	Clayey	3,400	2,600	1,800	green needlegrass----- western wheatgrass----- big bluestem----- sideoats grama----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- sedge-----	35 20 10 10 10 5 5 5
Beotia-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5
Ho: Harmony-----	Clayey	3,400	2,600	1,800	green needlegrass----- western wheatgrass----- big bluestem----- sideoats grama----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- sedge-----	35 20 10 10 10 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Ho: (cont.) Beotia-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5 5
Hp: Harriet-----	Saline Lowland	4,800	3,800	2,800	alkali cordgrass----- prairie cordgrass----- slender wheatgrass----- western wheatgrass----- Nuttall's alkaligrass----- inland saltgrass----- miscellaneous perennial forbs--	20 20 20 20 10 5 5
Hr: Heil-----	Closed Depression	3,400	3,100	2,200	western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses inland saltgrass----- other perennial grasslikes----- sedge-----	65 10 10 5 5 5
HsA: Henkin-----	Sandy	3,600	2,800	2,000	big bluestem----- little bluestem----- prairie sandreed----- needleandthread----- porcupinegrass----- sand bluestem----- sideoats grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge-----	15 15 15 10 10 10 10 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
HsA: (cont.) Blendon-----	Sandy	3,600	2,800	2,000	big bluestem----- little bluestem----- prairie sandreed----- needleandthread----- porcupinegrass----- sand bluestem----- sideoats grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge-----	15 15 15 10 10 10 10 5 5 5
HsB: Henkin-----	Sandy	3,600	2,800	2,000	big bluestem----- little bluestem----- prairie sandreed----- needleandthread----- porcupinegrass----- sand bluestem----- sideoats grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge-----	15 15 15 10 10 10 10 5 5 5
Blendon-----	Sandy	3,600	2,800	2,000	big bluestem----- little bluestem----- prairie sandreed----- needleandthread----- porcupinegrass----- sand bluestem----- sideoats grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge-----	15 15 15 10 10 10 10 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
HtB: Houdek-----	Loamy	3,600	2,800	1,600	green needlegrass-----	20
					big bluestem-----	15
					western wheatgrass-----	15
					needleandthread-----	10
					porcupinegrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					sedge-----	5
					sideoats grama-----	5
Ethan-----	Thin Upland	3,200	2,400	1,600	slender wheatgrass-----	5
					little bluestem-----	30
					porcupinegrass-----	15
					green needlegrass-----	10
					needleandthread-----	10
					sideoats grama-----	10
					big bluestem-----	5
					miscellaneous perennial forbs--	5
					miscellaneous shrubs-----	5
					prairie sandreed-----	5
Prosper-----	Loamy Overflow	4,800	3,800	2,800	western wheatgrass-----	5
					big bluestem-----	40
					green needlegrass-----	15
					porcupinegrass-----	10
					switchgrass-----	10
					western wheatgrass-----	10
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
HtC: Houdek-----	Loamy	3,600	2,800	1,600	miscellaneous shrubs-----	5
					green needlegrass-----	20
					big bluestem-----	15
					western wheatgrass-----	15
					needleandthread-----	10
					porcupinegrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					sedge-----	5
					sideoats grama-----	5
					slender wheatgrass-----	5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
HtC: (cont.) Ethan-----	Thin Upland	3,200	2,400	1,600	little bluestem----- porcupinegrass----- green needlegrass----- needleandthread----- sideoats grama----- big bluestem----- miscellaneous perennial forbs-- miscellaneous shrubs----- prairie sandreed----- western wheatgrass-----	30 15 10 10 10 5 5 5 5 5
Prosper-----	Loamy	3,600	2,800	1,600	green needlegrass----- big bluestem----- western wheatgrass----- needleandthread----- porcupinegrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama----- slender wheatgrass-----	20 15 15 10 10 5 5 5 5 5 5
HuA: Houdek-----	Loamy	3,600	2,800	1,600	green needlegrass----- big bluestem----- western wheatgrass----- needleandthread----- porcupinegrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama----- slender wheatgrass-----	20 15 15 10 10 5 5 5 5 5 5
Prosper-----	Loamy Overflow	4,800	3,800	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
HuB: Houdek-----	Loamy	3,600	2,800	1,600	green needlegrass-----	20
					big bluestem-----	15
					western wheatgrass-----	15
					needleandthread-----	10
					porcupinegrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					sedge-----	5
					sideoats grama-----	5
Prosper-----	Loamy Overflow	4,800	3,800	2,800	slender wheatgrass-----	5
					big bluestem-----	40
					green needlegrass-----	15
					porcupinegrass-----	10
					switchgrass-----	10
					western wheatgrass-----	10
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
HwA: Houdek-----	Loamy	3,600	2,800	1,600	miscellaneous shrubs-----	5
					green needlegrass-----	20
					big bluestem-----	15
					western wheatgrass-----	15
					needleandthread-----	10
					porcupinegrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					sedge-----	5
Stickney-----	Clayey	3,400	2,600	1,800	sideoats grama-----	5
					slender wheatgrass-----	5
					western wheatgrass-----	30
					green needlegrass-----	25
					big bluestem-----	10
					sideoats grama-----	10
					blue grama-----	5
					buffalograss-----	5
					miscellaneous perennial forbs--	5
					porcupinegrass-----	5
					sedge-----	5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
HxA: Houdek-----	Loamy	3,600	2,800	1,600	green needlegrass----- big bluestem----- western wheatgrass----- needleandthread----- porcupinegrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama----- slender wheatgrass-----	20 15 15 10 10 5 5 5 5 5 5
Stickney-----	Clayey	3,400	2,600	1,800	western wheatgrass----- green needlegrass----- big bluestem----- sideoats grama----- blue grama----- buffalograss----- miscellaneous perennial forbs-- porcupinegrass----- sedge-----	30 25 10 10 5 5 5 5 5
Tetonka-----	Wet Meadow	5,000	4,200	3,500	prairie cordgrass----- northern reedgrass----- other perennial grasslikes----- slough sedge----- woolly sedge----- clustered field sedge----- miscellaneous perennial forbs-- miscellaneous perennial grasses switchgrass-----	25 20 10 10 10 5 5 5 5
Hy: Hoven-----	Closed Depression	3,900	3,500	2,500	western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses inland saltgrass----- other perennial grasslikes----- sedge-----	65 10 10 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Ie: Ipage-----	Sandy	3,600	2,800	2,000	big bluestem-----	15
					little bluestem-----	15
					prairie sandreed-----	15
					needleandthread-----	10
					porcupinegrass-----	10
					sand bluestem-----	10
					sideoats grama-----	10
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					sedge-----	5
Els-----	Subirrigated	6,200	5,000	3,800	big bluestem-----	40
					switchgrass-----	15
					northern reedgrass-----	10
					sedge-----	10
					yellow Indiangrass-----	10
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					prairie cordgrass-----	5
Shue-----	Wet Meadow	6,200	5,000	3,800	prairie cordgrass-----	25
					northern reedgrass-----	20
					other perennial grasslikes-----	10
					slough sedge-----	10
					woolly sedge-----	10
					clustered field sedge-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					switchgrass-----	5
Jh: Jerauld-----	Thin Claypan	1,800	1,300	800	western wheatgrass-----	45
					blue grama-----	20
					sedge-----	10
					buffalograss-----	5
					inland saltgrass-----	5
					needleleaf sedge-----	5
					miscellaneous perennial forbs--	5
					miscellaneous shrubs-----	5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Jh: (cont.) Hoven-----	Closed Depression	3,900	3,500	2,500	western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses inland saltgrass----- other perennial grasslikes----- sedge-----	65 10 10 5 5 5
KaA: Kranzburg-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5
Brookings-----	Loamy Overflow	4,800	3,800	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5
KbB: Kranzburg-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
KbB: (cont.) Brookings-----	Loamy Overflow	4,800	3,800	2,800	big bluestem-----	40
					green needlegrass-----	15
					porcupinegrass-----	10
					switchgrass-----	10
					western wheatgrass-----	10
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
Buse-----	Thin Loamy	3,400	2,200	1,400	little bluestem-----	25
					porcupinegrass-----	25
					green needlegrass-----	10
					needleandthread-----	10
					big bluestem-----	5
					blue grama-----	5
					miscellaneous perennial forbs--	5
					sedge-----	5
					sideoats grama-----	5
KcA: Kranzburg-----	Loamy	3,600	2,800	1,600	western wheatgrass-----	15
					needleandthread-----	10
					porcupinegrass-----	10
					slender wheatgrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					other perennial grasslikes----	5
					miscellaneous shrubs-----	5
					sideoats grama-----	5
					slender wheatgrass-----	5
Cresbard-----	Clayey	3,400	2,600	1,800	green needlegrass-----	35
					western wheatgrass-----	20
					big bluestem-----	10
					sideoats grama-----	10
					slender wheatgrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					sedge-----	5

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
KtA: Kranzburg-----	Loamy	3,600	2,800	1,600	green needlegrass-----	20
					western wheatgrass-----	15
					needleandthread-----	10
					porcupinegrass-----	10
					slender wheatgrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					other perennial grasslikes-----	5
					miscellaneous shrubs-----	5
					sideoats grama-----	5
					slender wheatgrass-----	5
Cresbard-----	Clayey	3,400	2,600	1,800	green needlegrass-----	35
					western wheatgrass-----	20
					big bluestem-----	10
					sideoats grama-----	10
					slender wheatgrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					sedge-----	5
Tonka-----	Wet Meadow	5,500	4,500	3,500	prairie cordgrass-----	30
					northern reedgrass-----	15
					clustered field sedge-----	10
					other perennial grasslikes-----	10
					woolly sedge-----	10
					fowl bluegrass-----	5
					miscellaneous perennial grasses	5
					spikerush-----	5
					switchgrass-----	5
					western wheatgrass-----	5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
KzB: Kranzburg-----	Loamy	3,600	2,800	1,600	green needlegrass-----	20
					western wheatgrass-----	15
					needleandthread-----	10
					porcupinegrass-----	10
					slender wheatgrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					other perennial grasslikes-----	5
					miscellaneous shrubs-----	5
					sideoats grama-----	5
					slender wheatgrass-----	5
Zell-----	Thin Loamy	3,400	2,200	1,400	little bluestem-----	25
					porcupinegrass-----	25
					green needlegrass-----	10
					needleandthread-----	10
					big bluestem-----	5
					blue grama-----	5
					miscellaneous perennial forbs--	5
					sedge-----	5
					sideoats grama-----	5
					western wheatgrass-----	5
Aastad-----	Loamy Overflow	4,800	3,800	2,800	big bluestem-----	40
					green needlegrass-----	15
					porcupinegrass-----	10
					switchgrass-----	10
					western wheatgrass-----	10
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
La: La Prairie-----	Loamy	3,600	2,800	1,600	green needlegrass-----	20
					western wheatgrass-----	15
					needleandthread-----	10
					porcupinegrass-----	10
					slender wheatgrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					other perennial grasslikes-----	5
					miscellaneous shrubs-----	5
					sideoats grama-----	5
					slender wheatgrass-----	5
Lc: La Prairie, channeled---	Loamy Overflow	4,800	3,800	2,800	big bluestem-----	40
					green needlegrass-----	15
					porcupinegrass-----	10
					switchgrass-----	10
					western wheatgrass-----	10
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
Holmquist, channeled---	Saline Subirrigated	5,600	4,400	3,500	big bluestem-----	25
					switchgrass-----	15
					little bluestem-----	10
					prairie cordgrass-----	10
					western wheatgrass-----	10
					yellow Indiangrass-----	10
					alkali sacaton-----	5
					miscellaneous perennial forbs--	5
					saltgrass-----	5
					sedge-----	5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Ld: LaDelle-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 5 5 5 5 5 5 5
Le: LaDelle, channeled-----	Loamy Overflow	4,800	3,800	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5
Lk: Lamo-----	Subirrigated	6,200	5,000	3,800	big bluestem----- switchgrass----- northern reedgrass----- sedge----- yellow Indiangrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses prairie cordgrass-----	40 15 10 10 10 5 5 5
Lm: Lamoure-----	Subirrigated	6,000	4,700	3,500	big bluestem----- switchgrass----- northern reedgrass----- slender wheatgrass----- yellow Indiangrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- sedge----- western wheatgrass-----	30 15 10 10 10 5 5 5 5 5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Ln: Lawet-----	Subirrigated	6,200	5,000	3,800	big bluestem----- switchgrass----- northern reedgrass----- sedge----- yellow Indiangrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses prairie cordgrass-----	40 15 10 10 10 5 5 5
Lo: Lawet, wet-----	Wet Land	7,000	6,000	5,000	common rivergrass----- prairie cordgrass----- slough sedge----- water smartweed----- American mannagrass----- miscellaneous perennial forbs-- other perennial grasslikes-----	20 20 20 15 10 10 5
Lp: Lawet-----	Subirrigated	6,200	5,000	3,800	big bluestem----- switchgrass----- northern reedgrass----- sedge----- yellow Indiangrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses prairie cordgrass-----	40 15 10 10 10 5 5 5
Davison-----	Limy Subirrigated	5,500	4,000	3,000	little bluestem----- big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge-----	25 15 10 10 10 10 5 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
LrA: Lehr-----	Shallow Gravel	2,100	1,600	800	needleandthread----- blue grama----- green needlegrass----- miscellaneous perennial grasses western wheatgrass----- miscellaneous perennial forbs-- plains muhly----- prairie dropseed----- sedge----- threeawn-----	30 15 10 10 5 5 5 5 5 5
Bowdle-----	Loamy	3,400	2,400	1,400	green needlegrass----- western wheatgrass----- slender wheatgrass----- blue grama----- needleandthread----- big bluestem----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama-----	20 20 15 10 10 5 5 5 5 5
LrB: Lehr-----	Shallow Gravel	2,100	1,600	800	needleandthread----- blue grama----- green needlegrass----- miscellaneous perennial grasses western wheatgrass----- miscellaneous perennial forbs-- plains muhly----- prairie dropseed----- sedge----- threeawn-----	30 15 10 10 10 5 5 5 5 5
Bowdle-----	Loamy	3,400	2,400	1,400	green needlegrass----- western wheatgrass----- slender wheatgrass----- blue grama----- needleandthread----- big bluestem----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama-----	20 20 15 10 10 5 5 5 5 5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Ls: Lowe-----	Subirrigated	6,000	4,700	3,500	big bluestem----- switchgrass----- northern reedgrass----- slender wheatgrass----- yellow Indiangrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- sedge----- western wheatgrass-----	30 15 10 10 10 5 5 5 5 5
Lt: Ludden-----	Wet Land	8,000	6,500	4,500	slough sedge----- common rivergrass----- water smartweed----- American mannagrass----- American sloughgrass----- miscellaneous perennial forbs-- other perennial grasslikes-----	35 25 15 10 5 5 5
Lu: Ludden, ponded-----	---	---	---	---	---	---
Lw: Ludden, wet-----	Wet Land	8,000	6,500	4,500	slough sedge----- common rivergrass----- water smartweed----- American mannagrass----- American sloughgrass----- miscellaneous perennial forbs-- other perennial grasslikes-----	35 25 15 10 5 5 5
M-W: Miscellaneous water-----	---	---	---	---	---	---

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
MaC: Maddock-----	Sandy	3,600	2,800	1,900	prairie sandreed----- big bluestem----- little bluestem----- needleandthread----- porcupinegrass----- sedge----- blue grama----- green needlegrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	20 15 10 10 10 10 5 5 5 5 5
Egeland-----	Sandy	3,600	2,800	1,900	prairie sandreed----- big bluestem----- little bluestem----- needleandthread----- porcupinegrass----- sedge----- blue grama----- green needlegrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	20 15 10 10 10 10 5 5 5 5 5
MdA: Max-----	Loamy	3,400	2,400	1,400	green needlegrass----- western wheatgrass----- slender wheatgrass----- blue grama----- needleandthread----- big bluestem----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama-----	20 20 15 10 10 5 5 5 5 5
Arnegard-----	Loamy Overflow	4,300	3,500	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
MdB: Max-----	Loamy	3,400	2,400	1,400	green needlegrass----- western wheatgrass----- slender wheatgrass----- blue grama----- needleandthread----- big bluestem----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama-----	20 20 15 10 10 5 5 5 5 5
Arnegard-----	Loamy Overflow	4,300	3,500	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5
MgB: Max-----	Loamy	3,400	2,400	1,400	green needlegrass----- western wheatgrass----- slender wheatgrass----- blue grama----- needleandthread----- big bluestem----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama-----	20 20 15 10 10 5 5 5 5 5
Arnegard-----	Loamy Overflow	4,300	3,500	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
MgB: (cont.) Zahl-----	Thin Loamy	2,400	1,900	1,400	little bluestem----- porcupinegrass----- green needlegrass----- needleandthread----- sideoats grama----- blue grama----- miscellaneous perennial forbs-- plains muhly----- sedge-----	25 20 15 10 10 5 5 5 5
MnB: Max-----	Loamy	3,400	2,400	1,400	green needlegrass----- western wheatgrass----- slender wheatgrass----- blue grama----- needleandthread----- big bluestem----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama-----	20 20 15 10 10 5 5 5 5 5
Niobell-----	Clayey	3,100	2,300	1,300	western wheatgrass----- green needlegrass----- miscellaneous perennial grasses blue grama----- miscellaneous perennial forbs-- thickspike wheatgrass----- miscellaneous shrubs-----	30 20 15 10 10 10 5
Noonan-----	Claypan	2,200	1,700	1,200	western wheatgrass----- blue grama----- miscellaneous perennial grasses green needlegrass----- needleandthread----- needleleaf sedge----- miscellaneous perennial forbs-- miscellaneous shrubs-----	40 20 15 5 5 5 5 5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
MxC: Max-----	Loamy	3,400	2,400	1,400	green needlegrass----- western wheatgrass----- slender wheatgrass----- blue grama----- needleandthread----- big bluestem----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama-----	20 20 15 10 10 5 5 5 5 5
Zahl-----	Thin Loamy	2,400	1,900	1,400	little bluestem----- porcupinegrass----- green needlegrass----- needleandthread----- sideoats grama----- blue grama----- miscellaneous perennial forbs-- plains muhly----- sedge-----	25 20 15 10 10 5 5 5 5
Arnegard-----	Loamy	3,400	2,400	1,400	green needlegrass----- western wheatgrass----- slender wheatgrass----- blue grama----- needleandthread----- big bluestem----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama-----	20 20 15 10 10 5 5 5 5 5
My: Miranda-----	Thin Claypan	1,300	1,000	500	western wheatgrass----- blue grama----- sedge----- Sandberg bluegrass----- buffalograss----- inland saltgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses prairie Junegrass-----	35 25 10 5 5 5 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

696

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
My: (cont.) Heil-----	Closed Depression	4,500	3,500	2,000	western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses inland saltgrass----- other perennial grasslikes----- sedge-----	65 10 10 5 5 5
Mz: Moritz-----	Limy Subirrigated	5,500	4,000	3,000	little bluestem----- big bluestem----- green needlegrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses switchgrass----- other perennial grasslikes----- porcupinegrass----- yellow Indiangrass-----	30 15 10 10 10 10 5 5 5
Lowe-----	Subirrigated	6,000	4,700	3,500	big bluestem----- switchgrass----- northern reedgrass----- slender wheatgrass----- yellow Indiangrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- sedge----- western wheatgrass-----	30 15 10 10 10 5 5 5 5 5
Na: Nahon-----	Claypan	2,600	2,000	1,400	western wheatgrass----- green needlegrass----- blue grama----- needleandthread----- sedge----- buffalograss----- miscellaneous perennial forbs-- porcupinegrass-----	30 20 15 10 10 5 5 5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Na: (cont.) Aberdeen-----	Clayey	3,400	2,600	1,800	green needlegrass----- western wheatgrass----- big bluestem----- sideoats grama----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- sedge-----	35 20 10 10 5 5 5
Exline-----	Thin Claypan	1,800	1,300	800	western wheatgrass----- blue grama----- Nuttall's alkaligrass----- buffalograss----- inland saltgrass----- needleandthread----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge-----	45 20 5 5 5 5 5 5
Nb: Nahon-----	Claypan	2,600	2,000	1,400	western wheatgrass----- green needlegrass----- blue grama----- needleandthread----- sedge----- buffalograss----- miscellaneous perennial forbs-- porcupinegrass-----	30 20 15 10 10 5 5 5
Aberdeen-----	Clayey	3,400	2,600	1,800	green needlegrass----- western wheatgrass----- big bluestem----- sideoats grama----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- sedge-----	35 20 10 10 10 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

698

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Nb: (cont.) Exline-----	Thin Claypan	1,800	1,300	800	western wheatgrass----- blue grama----- Nuttall's alkaligrass----- buffalograss----- inland saltgrass----- needleandthread----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge-----	45 20 5 5 5 5 5 5
Nc: Niobell-----	Clayey	3,100	2,300	1,300	western wheatgrass----- green needlegrass----- miscellaneous perennial grasses blue grama----- miscellaneous perennial forbs-- thickspike wheatgrass----- miscellaneous shrubs-----	30 20 15 10 10 10 5
Noonan-----	Claypan	2,200	1,700	1,200	western wheatgrass----- blue grama----- miscellaneous perennial grasses green needlegrass----- needleandthread----- needleleaf sedge----- miscellaneous perennial forbs-- miscellaneous shrubs-----	40 20 15 5 5 5 5 5
Nd: Niobell-----	Clayey	3,100	2,300	1,300	western wheatgrass----- green needlegrass----- miscellaneous perennial grasses blue grama----- miscellaneous perennial forbs-- thickspike wheatgrass----- miscellaneous shrubs-----	30 20 15 10 10 10 5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Nd: (cont.) Noonan-----	Claypan	2,200	1,700	1,200	western wheatgrass----- blue grama----- miscellaneous perennial grasses green needlegrass----- needleandthread----- needleleaf sedge----- miscellaneous perennial forbs-- miscellaneous shrubs-----	40 20 15 5 5 5 5 5
Heil-----	Closed Depression	4,500	3,500	2,000	western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses inland saltgrass----- other perennial grasslikes---- sedge-----	65 10 10 5 5 5
NeA: Niobell-----	Clayey	3,100	2,300	1,300	western wheatgrass----- green needlegrass----- miscellaneous perennial grasses blue grama----- miscellaneous perennial forbs-- thickspike wheatgrass----- miscellaneous shrubs-----	30 20 15 10 10 10 5
Noonan-----	Claypan	2,200	1,700	1,200	western wheatgrass----- blue grama----- miscellaneous perennial grasses green needlegrass----- needleandthread----- needleleaf sedge----- miscellaneous perennial forbs-- miscellaneous shrubs-----	40 20 15 5 5 5 5 5
Max-----	Loamy	3,400	2,400	1,400	green needlegrass----- western wheatgrass----- slender wheatgrass----- blue grama----- needleandthread----- big bluestem----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama-----	20 20 15 10 10 5 5 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

700

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Nm: Noonan-----	Claypan	2,200	1,700	1,200	western wheatgrass----- blue grama----- miscellaneous perennial grasses green needlegrass----- needleandthread----- needleleaf sedge----- miscellaneous perennial forbs-- miscellaneous shrubs-----	40 20 15 5 5 5 5 5
Miranda-----	Thin Claypan	1,300	1,000	500	western wheatgrass----- blue grama----- sedge----- Sandberg bluegrass----- buffalograss----- inland saltgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses prairie Junegrass-----	35 25 10 5 5 5 5 5 5
Nr: Northville-----	Clayey	3,400	2,600	1,800	western wheatgrass----- green needlegrass----- big bluestem----- sideoats grama----- blue grama----- buffalograss----- miscellaneous perennial forbs-- porcupinegrass----- sedge-----	30 25 10 10 5 5 5 5 5
Farmsworth-----	Claypan	2,600	2,000	1,400	western wheatgrass----- green needlegrass----- blue grama----- needleandthread----- miscellaneous perennial forbs-- sedge----- buffalograss-----	30 20 15 10 10 10 5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Nv: Northville-----	Clayey	3,400	2,600	1,800	western wheatgrass-----	30
					green needlegrass-----	25
					big bluestem-----	10
					sideoats grama-----	10
					blue grama-----	5
					buffalograss-----	5
					miscellaneous perennial forbs--	5
					porcupinegrass-----	5
					sedge-----	5
Farmsworth-----	Claypan	2,600	2,000	1,400	western wheatgrass-----	30
					green needlegrass-----	20
					blue grama-----	15
					needleandthread-----	10
					miscellaneous perennial forbs--	10
					sedge-----	10
					buffalograss-----	5
Hoven-----	Closed Depression	3,900	3,500	2,500	western wheatgrass-----	65
					miscellaneous perennial forbs--	10
					miscellaneous perennial grasses	10
					inland saltgrass-----	5
					other perennial grasslikes-----	5
					sedge-----	5
Ov: Overshue-----	Wet Meadow	5,000	4,200	3,500	prairie cordgrass-----	25
					northern reedgrass-----	20
					other perennial grasslikes-----	10
					slough sedge-----	10
					woolly sedge-----	10
					clustered field sedge-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					switchgrass-----	5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Pa: Parnell-----	Shallow Marsh	6,600	6,000	4,800	common rivergrass----- slough sedge----- American manna grass----- common spikerush----- prairie cordgrass----- northern reedgrass----- miscellaneous perennial forbs-- other perennial grasslikes----- sedge-----	25 25 10 10 10 5 5 5 5
Pc: Parshall-----	Sandy	3,400	2,500	1,600	prairie sandreed----- needleandthread----- big bluestem----- blue grama----- green needlegrass----- slender wheatgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes-----	20 15 10 10 10 10 10 5 5 5
PeA: Peever-----	Clayey	3,400	2,600	1,800	green needlegrass----- western wheatgrass----- big bluestem----- sideoats grama----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- sedge-----	35 20 10 10 10 5 5 5
PgB: Peever-----	Clayey	3,400	2,600	1,800	green needlegrass----- western wheatgrass----- big bluestem----- sideoats grama----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- sedge-----	35 20 10 10 10 5 5 5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
PgB: (cont.)						
Buse-----	Thin Loamy	3,400	2,200	1,400	little bluestem-----	25
					porcupinegrass-----	25
					green needlegrass-----	10
					needleandthread-----	10
					big bluestem-----	5
					blue grama-----	5
					miscellaneous perennial forbs--	5
					sedge-----	5
					sideoats grama-----	5
					western wheatgrass-----	5
PoA:						
Peever-----	Clayey	3,400	2,600	1,800	green needlegrass-----	35
					western wheatgrass-----	20
					big bluestem-----	10
					sideoats grama-----	10
					slender wheatgrass-----	10
					blue grama-----	5
					miscellaneous perennial forbs--	5
					sedge-----	5
Cavour-----	Claypan	2,600	2,000	1,400	western wheatgrass-----	30
					green needlegrass-----	20
					blue grama-----	15
					needleandthread-----	10
					sedge-----	10
					buffalograss-----	5
					miscellaneous perennial forbs--	5
					porcupinegrass-----	5
Pp:						
Pits, gravel and sand---	---	1,400	1,200	700	needlegrass-----	35
					blue grama-----	30
					sedge-----	20
					plains muhly-----	10
					western wheatgrass-----	5

Ecological Site Productivity and Characteristic Plant Communities--Continued

704

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Pr: Playmoor-----	Saline Subirrigated	5,600	4,400	3,500	big bluestem----- switchgrass----- little bluestem----- prairie cordgrass----- western wheatgrass----- yellow Indiangrass----- alkali sacaton----- miscellaneous perennial forbs-- saltgrass----- sedge-----	25 15 10 10 10 10 5 5 5 5
Py: Playmoor, channeled-----	Saline Subirrigated	5,600	4,400	3,500	big bluestem----- switchgrass----- little bluestem----- prairie cordgrass----- western wheatgrass----- yellow Indiangrass----- alkali sacaton----- miscellaneous perennial forbs-- saltgrass----- sedge-----	25 15 10 10 10 10 5 5 5 5
Lamoure, channeled-----	Subirrigated	6,000	4,700	3,500	big bluestem----- switchgrass----- northern reedgrass----- slender wheatgrass----- yellow Indiangrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- sedge----- western wheatgrass-----	30 15 10 10 10 5 5 5 5 5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Ra: Ranslo-----	Subirrigated	6,000	4,700	3,500	big bluestem-----	30
					switchgrass-----	15
					northern reedgrass-----	10
					slender wheatgrass-----	10
					yellow Indiangrass-----	10
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					other perennial grasslikes-----	5
					sedge-----	5
					western wheatgrass-----	5
Re: Ranslo-----	Subirrigated	6,000	4,700	3,500	big bluestem-----	30
					switchgrass-----	15
					northern reedgrass-----	10
					slender wheatgrass-----	10
					yellow Indiangrass-----	10
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					other perennial grasslikes-----	5
					sedge-----	5
					western wheatgrass-----	5
Harriet-----	Saline Lowland	4,800	3,800	2,800	alkali cordgrass-----	20
					prairie cordgrass-----	20
					slender wheatgrass-----	20
					western wheatgrass-----	20
					Nuttall's alkaligrass-----	10
					inland saltgrass-----	5
					miscellaneous perennial forbs--	5
RfA: Renshaw-----	Shallow Gravel	2,500	1,900	1,100	needleandthread-----	35
					green needlegrass-----	10
					threadleaf sedge-----	10
					blue grama-----	5
					little bluestem-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
					plains muhly-----	5
					porcupinegrass-----	5
					prairie dropseed-----	5
					western wheatgrass-----	5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
RfA: (cont.) Fordville-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5 5
RfB: Renshaw-----	Shallow Gravel	2,500	1,900	1,100	needleandthread----- green needlegrass----- threadleaf sedge----- blue grama----- little bluestem----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- plains muhly----- porcupinegrass----- prairie dropseed----- western wheatgrass-----	35 10 10 5 5 5 5 5 5 5 5 5
Fordville-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5 5
So: Southam-----	---	---	---	---	---	---

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
St: Stickney-----	Clayey	3,400	2,600	1,800	western wheatgrass----- green needlegrass----- big bluestem----- sideoats grama----- blue grama----- buffalograss----- miscellaneous perennial forbs-- porcupinegrass----- sedge-----	30 25 10 10 5 5 5 5 5
Dudley-----	Claypan	2,600	2,000	1,400	western wheatgrass----- green needlegrass----- blue grama----- needleandthread----- miscellaneous perennial forbs-- sedge----- buffalograss-----	30 20 15 10 10 10 5
Su: Stickney-----	Clayey	3,400	2,600	1,800	western wheatgrass----- green needlegrass----- big bluestem----- sideoats grama----- blue grama----- buffalograss----- miscellaneous perennial forbs-- porcupinegrass----- sedge-----	30 25 10 10 5 5 5 5 5
Dudley-----	Claypan	2,600	2,000	1,400	western wheatgrass----- green needlegrass----- blue grama----- needleandthread----- miscellaneous perennial forbs-- sedge----- buffalograss-----	30 20 15 10 10 10 5
Hoven-----	Closed Depression	3,900	3,500	2,500	western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses inland saltgrass----- other perennial grasslikes----- sedge-----	65 10 10 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Sw: Straw, channeled-----	Loamy Overflow	4,300	3,500	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5
Sx: Straw-----	Loamy	3,400	2,400	1,400	green needlegrass----- western wheatgrass----- slender wheatgrass----- blue grama----- needleandthread----- big bluestem----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama-----	20 20 15 10 10 5 5 5 5 5
TbE: Talmo, stony-----	Very Shallow	1,800	1,500	900	needleandthread----- miscellaneous perennial forbs-- threadleaf sedge----- blue grama----- miscellaneous perennial grasses western wheatgrass----- plains muhly-----	30 20 15 10 10 10 5
Ethan, stony-----	Thin Upland	3,200	2,400	1,600	little bluestem----- porcupinegrass----- green needlegrass----- needleandthread----- sideoats grama----- big bluestem----- miscellaneous perennial forbs-- miscellaneous shrubs----- prairie sandreed----- western wheatgrass-----	30 15 10 10 10 5 5 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Te: Tetonka-----	Wet Meadow	5,000	4,200	3,500	prairie cordgrass----- northern reedgrass----- other perennial grasslikes---- slough sedge----- woolly sedge----- clustered field sedge----- miscellaneous perennial forbs-- miscellaneous perennial grasses switchgrass-----	25 20 10 10 10 5 5 5 5
Tk: Toko-----	Wet Meadow	5,000	4,200	3,500	prairie cordgrass----- northern reedgrass----- other perennial grasslikes---- slough sedge----- woolly sedge----- clustered field sedge----- miscellaneous perennial forbs-- miscellaneous perennial grasses switchgrass-----	25 20 10 10 10 5 5 5 5
Tm: Toko, wet-----	Shallow Marsh	7,000	6,000	5,000	common rivergrass----- slough sedge----- American mannagrass----- common spikerush----- prairie cordgrass----- northern reedgrass----- miscellaneous perennial forbs-- other perennial grasslikes---- sedge-----	25 25 10 10 10 5 5 5 5
Tn: Tonka-----	Wet Meadow	5,500	4,500	3,500	prairie cordgrass----- northern reedgrass----- clustered field sedge----- other perennial grasslikes---- woolly sedge----- fowl bluegrass----- miscellaneous perennial grasses spikerush----- switchgrass----- western wheatgrass-----	30 15 10 10 10 5 5 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
To: Tonka-----	Wet Meadow	5,500	4,500	3,500	prairie cordgrass----- northern reedgrass----- other perennial grasslikes---- clustered field sedge----- miscellaneous perennial grasses common spikerush----- fowl bluegrass----- switchgrass----- western wheatgrass-----	30 15 15 10 10 5 5 5 5
Rimlap-----	Wet Meadow	5,500	4,500	3,500	prairie cordgrass----- northern reedgrass----- other perennial grasslikes---- clustered field sedge----- miscellaneous perennial grasses common spikerush----- fowl bluegrass----- switchgrass----- western wheatgrass-----	30 15 15 10 10 5 5 5 5
Us: Udorthents, silty-----	---	2,600	2,100	1,600	western wheatgrass----- green needlegrass----- Hesperostipa spartea----- needleandthread----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs----- blue grama----- other perennial grasslikes---- slender wheatgrass-----	25 20 10 10 10 10 10 5 5 5
Va: Vallars-----	Subirrigated	6,000	4,700	3,500	big bluestem----- switchgrass----- northern reedgrass----- slender wheatgrass----- yellow Indiangrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes---- sedge----- western wheatgrass-----	30 15 10 10 10 5 5 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Va: (cont.) Hamerly-----	Limy Subirrigated	5,500	4,000	3,000	little bluestem----- big bluestem----- green needlegrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses switchgrass----- other perennial grasslikes----- porcupinegrass----- yellow Indiangrass-----	30 15 10 10 10 10 5 5 5
VgA: Vang-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5 5
W: Water-----	---	---	---	---	---	---
WaA: Williams-----	Loamy	3,400	2,400	1,400	green needlegrass----- western wheatgrass----- slender wheatgrass----- blue grama----- needleandthread----- big bluestem----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama-----	20 20 15 10 10 5 5 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

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Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
WaA: (cont.) Bowbells-----	Loamy Overflow	4,300	3,500	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5
WaB: Williams-----	Loamy	3,400	2,400	1,400	green needlegrass----- western wheatgrass----- slender wheatgrass----- blue grama----- needleandthread----- big bluestem----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama-----	20 20 15 10 10 5 5 5 5 5
Bowbells-----	Loamy Overflow	4,300	3,500	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5
WbA: Williams-----	Loamy	3,400	2,400	1,400	green needlegrass----- western wheatgrass----- slender wheatgrass----- blue grama----- needleandthread----- big bluestem----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama-----	20 20 15 10 10 5 5 5 5 5

Soil Survey

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
WbA: (cont.)						
Bowbells-----	Loamy Overflow	4,300	3,500	2,800	big bluestem-----	40
					green needlegrass-----	15
					porcupinegrass-----	10
					switchgrass-----	10
					western wheatgrass-----	10
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5
Tonka-----	Wet Meadow	5,500	4,500	3,500	prairie cordgrass-----	30
					northern reedgrass-----	15
					other perennial grasslikes----	15
					clustered field sedge-----	10
					miscellaneous perennial grasses	10
					common spikerush-----	5
					fowl bluegrass-----	5
					switchgrass-----	5
					western wheatgrass-----	5
WbB:						
Williams-----	Loamy	3,400	2,400	1,400	green needlegrass-----	20
					western wheatgrass-----	20
					slender wheatgrass-----	15
					blue grama-----	10
					needleandthread-----	10
					big bluestem-----	5
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					sedge-----	5
					sideoats grama-----	5
Bowbells-----	Loamy Overflow	4,300	3,500	2,800	big bluestem-----	40
					green needlegrass-----	15
					porcupinegrass-----	10
					switchgrass-----	10
					western wheatgrass-----	10
					miscellaneous perennial forbs--	5
					miscellaneous perennial grasses	5
					miscellaneous shrubs-----	5

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
WbB: (cont.) Tonka-----	Wet Meadow	5,500	4,500	3,500	prairie cordgrass----- northern reedgrass----- other perennial grasslikes----- clustered field sedge----- miscellaneous perennial grasses common spikerush----- fowl bluegrass----- switchgrass----- western wheatgrass-----	30 15 15 10 10 5 5 5 5
WcA: Williams-----	Loamy	3,400	2,400	1,400	green needlegrass----- western wheatgrass----- slender wheatgrass----- blue grama----- needleandthread----- big bluestem----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama-----	20 20 15 10 10 5 5 5 5 5
Niobell-----	Clayey	3,100	2,300	1,300	western wheatgrass----- green needlegrass----- miscellaneous perennial grasses blue grama----- miscellaneous perennial forbs-- thickspike wheatgrass----- miscellaneous shrubs-----	30 20 15 10 10 10 5
WcB: Williams-----	Loamy	3,400	2,400	1,400	green needlegrass----- western wheatgrass----- slender wheatgrass----- blue grama----- needleandthread----- big bluestem----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama-----	20 20 15 10 10 5 5 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
WcB: (cont.) Niobell-----	Clayey	3,100	2,300	1,300	western wheatgrass----- green needlegrass----- miscellaneous perennial grasses blue grama----- miscellaneous perennial forbs-- thickspike wheatgrass----- miscellaneous shrubs-----	30 20 15 10 10 10 5
WdA: Williams-----	Loamy	3,400	2,400	1,400	green needlegrass----- western wheatgrass----- slender wheatgrass----- blue grama----- needleandthread----- big bluestem----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama-----	20 20 15 10 10 5 5 5 5 5
Niobell-----	Clayey	3,100	2,300	1,300	western wheatgrass----- green needlegrass----- miscellaneous perennial grasses blue grama----- miscellaneous perennial forbs-- thickspike wheatgrass----- miscellaneous shrubs-----	30 20 15 10 10 10 5
Tonka-----	Wet Meadow	5,500	4,500	3,500	prairie cordgrass----- northern reedgrass----- other perennial grasslikes----- clustered field sedge----- miscellaneous perennial grasses common spikerush----- fowl bluegrass----- switchgrass----- western wheatgrass-----	30 15 15 10 10 5 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
WhD: Williams-----	Loamy	3,400	2,400	1,400	green needlegrass----- western wheatgrass----- slender wheatgrass----- blue grama----- needleandthread----- big bluestem----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama-----	20 20 15 10 10 5 5 5 5 5
Vida-----	Loamy	3,400	2,400	1,400	green needlegrass----- western wheatgrass----- slender wheatgrass----- blue grama----- needleandthread----- big bluestem----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama-----	20 20 15 10 10 5 5 5 5 5
WmB: Williams-----	Loamy	3,400	2,400	1,400	green needlegrass----- western wheatgrass----- slender wheatgrass----- blue grama----- needleandthread----- big bluestem----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama-----	20 20 15 10 10 5 5 5 5 5
Zahl-----	Thin Loamy	2,400	1,900	1,400	little bluestem----- porcupinegrass----- green needlegrass----- needleandthread----- sideoats grama----- blue grama----- miscellaneous perennial forbs-- plains muhly----- sedge-----	25 20 15 10 10 5 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
WmB: (cont.) Bowbells-----	Loamy Overflow	4,300	3,500	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5
WmC: Williams-----	Loamy	3,400	2,400	1,400	green needlegrass----- western wheatgrass----- slender wheatgrass----- blue grama----- needleandthread----- big bluestem----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama-----	20 20 15 10 10 5 5 5 5 5
Zahl-----	Thin Loamy	2,400	1,900	1,400	little bluestem----- porcupinegrass----- green needlegrass----- needleandthread----- sideoats grama----- blue grama----- miscellaneous perennial forbs-- plains muhly----- sedge-----	25 20 15 10 10 5 5 5 5
Bowbells-----	Loamy	3,400	2,400	1,400	green needlegrass----- western wheatgrass----- slender wheatgrass----- blue grama----- needleandthread----- big bluestem----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama-----	20 20 15 10 10 5 5 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Wn: Winship-----	Loamy Overflow	4,800	3,800	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5
Tonka-----	Wet Meadow	5,500	4,500	3,500	prairie cordgrass----- northern reedgrass----- clustered field sedge----- other perennial grasslikes----- woolly sedge----- fowl bluegrass----- miscellaneous perennial grasses spikerush----- switchgrass----- western wheatgrass-----	30 15 10 10 10 5 5 5 5 5
Wo: Winship-----	Loamy Overflow	4,800	3,800	2,800	big bluestem----- green needlegrass----- porcupinegrass----- switchgrass----- western wheatgrass----- miscellaneous perennial forbs-- miscellaneous perennial grasses miscellaneous shrubs-----	40 15 10 10 10 5 5 5
Tonka-----	Wet Meadow	5,500	4,500	3,500	prairie cordgrass----- northern reedgrass----- clustered field sedge----- other perennial grasslikes----- woolly sedge----- fowl bluegrass----- miscellaneous perennial grasses spikerush----- switchgrass----- western wheatgrass-----	30 15 10 10 10 5 5 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
Ws: Woonsocket-----	Sandy	3,600	2,800	2,000	big bluestem----- little bluestem----- prairie sandreed----- needleandthread----- porcupinegrass----- sand bluestem----- sideoats grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge-----	15 15 15 10 10 10 10 5 5 5
Whitelake-----	Claypan	2,600	2,000	1,400	western wheatgrass----- green needlegrass----- blue grama----- needleandthread----- miscellaneous perennial forbs-- sedge----- buffalograss-----	30 20 15 10 10 10 5
Wt: Worthing-----	Shallow Marsh	6,800	6,200	5,000	common rivergrass----- slough sedge----- American mannagrass----- common spikerush----- prairie cordgrass----- northern reedgrass----- miscellaneous perennial forbs-- other perennial grasslikes----- sedge-----	25 25 10 10 10 5 5 5 5
Ww: Worthing, ponded-----	---	---	---	---	---	---
ZaE: Zahill-----	Thin Loamy	2,400	1,900	1,400	little bluestem----- porcupinegrass----- green needlegrass----- needleandthread----- sideoats grama----- blue grama----- miscellaneous perennial forbs-- plains muhly----- sedge-----	25 20 15 10 10 5 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
ZbC: Zahl-----	Thin Loamy	2,400	1,900	1,400	little bluestem----- porcupinegrass----- green needlegrass----- needleandthread----- sideoats grama----- blue grama----- miscellaneous perennial forbs-- plains muhly----- sedge-----	25 20 15 10 10 5 5 5 5
Max-----	Loamy	3,400	2,400	1,400	green needlegrass----- western wheatgrass----- slender wheatgrass----- blue grama----- needleandthread----- big bluestem----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama-----	20 20 15 10 10 5 5 5 5 5
ZbD: Zahl-----	Thin Loamy	2,400	1,900	1,400	little bluestem----- porcupinegrass----- green needlegrass----- needleandthread----- sideoats grama----- blue grama----- miscellaneous perennial forbs-- plains muhly----- sedge-----	25 20 15 10 10 5 5 5 5
Max-----	Loamy	3,400	2,400	1,400	green needlegrass----- western wheatgrass----- slender wheatgrass----- blue grama----- needleandthread----- big bluestem----- miscellaneous perennial forbs-- miscellaneous perennial grasses sedge----- sideoats grama-----	20 20 15 10 10 5 5 5 5 5

Ecological Site Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production			Characteristic vegetation	Rangeland composition
		Favorable year	Normal year	Unfavorable year		
		Lb/acre	Lb/acre	Lb/acre		Pct
ZgD: Zell-----	Thin Loamy	3,400	2,200	1,400	little bluestem----- porcupinegrass----- green needlegrass----- needleandthread----- big bluestem----- blue grama----- miscellaneous perennial forbs-- sedge----- sideoats grama----- western wheatgrass-----	25 25 10 10 5 5 5 5 5 5
Great Bend-----	Loamy	3,600	2,800	1,600	green needlegrass----- western wheatgrass----- needleandthread----- porcupinegrass----- slender wheatgrass----- blue grama----- miscellaneous perennial forbs-- miscellaneous perennial grasses other perennial grasslikes----- miscellaneous shrubs----- sideoats grama----- slender wheatgrass-----	20 15 10 10 10 5 5 5 5 5 5

Windbreaks and Environmental Plantings

(Absence of an entry indicates that trees generally do not grow to the given height.)

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Aa: Aastad-----	American plum; Peking cotoneaster	common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine; Siberian crabapple	golden willow	eastern cottonwood
Ab: Aastad-----	Peking cotoneaster; redosier dogwood	American plum; common chokecherry; Siberian peashrub	blue spruce; eastern redcedar; Manchurian crabapple; white spruce	golden willow	eastern cottonwood
Hamerly-----	Peking cotoneaster; redosier dogwood	American plum; common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine	golden willow	eastern cottonwood
Ad: Aastad-----	American plum; Peking cotoneaster	common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine; Siberian crabapple	golden willow	eastern cottonwood
Tonka-----	---	---	---	---	---
Ae: Aberdeen-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
Nahon-----	common lilac; eastern redcedar; Rocky Mountain juniper; Russian olive; Siberian peashrub; silver buffaloberry	green ash; ponderosa pine; Siberian elm	---	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Ah: Aberdeen-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
Nahon-----	common lilac; eastern redcedar; Rocky Mountain juniper; Russian olive; Siberian peashrub; silver buffaloberry	green ash; ponderosa pine; Siberian elm	---	---	---
An: Aberdeen-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
Nahon-----	common lilac; eastern redcedar; Rocky Mountain juniper; Russian olive; Siberian peashrub; silver buffaloberry	green ash; ponderosa pine; Siberian elm	---	---	---
Heil-----	---	---	---	---	---
Ao: Aberdeen-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Ao: (cont.) Nahon-----	common lilac; eastern redcedar; Rocky Mountain juniper; Russian olive; Siberian peashrub; silver buffaloberry	green ash; ponderosa pine; Siberian elm	---	---	---
Heil-----	---	---	---	---	---
At: Aguents, loamy-----	---	---	---	---	---
BaC: Beadle-----	common lilac; Siberian peashrub; skunkbush sumac	Manchurian crabapple; Rocky Mountain juniper; Russian olive	common hackberry; eastern redcedar; green ash; honeylocust	Siberian elm	---
BdA: Beadle-----	common lilac; Siberian peashrub; skunkbush sumac	Manchurian crabapple; Rocky Mountain juniper; Russian olive	common hackberry; eastern redcedar; green ash; honeylocust	Siberian elm	---
Dudley-----	common lilac; eastern redcedar; Rocky Mountain juniper; Siberian peashrub; silver buffaloberry	green ash; ponderosa pine; Russian olive; Siberian elm	---	---	---
BeA: Beadle-----	common lilac; Siberian peashrub; skunkbush sumac	Manchurian crabapple; Rocky Mountain juniper; Russian olive	common hackberry; eastern redcedar; green ash; honeylocust	Siberian elm	---
Stickney-----	common lilac; Siberian peashrub; skunkbush sumac	Manchurian crabapple; Rocky Mountain juniper; Russian olive	common hackberry; eastern redcedar; green ash; honeylocust	Siberian elm	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
BeB: Beadle-----	common lilac; Siberian peashrub; skunkbush sumac	Manchurian crabapple; Rocky Mountain juniper; Russian olive	common hackberry; eastern redcedar; green ash; honeylocust	Siberian elm	---
Stickney-----	common lilac; Siberian peashrub; skunkbush sumac	Manchurian crabapple; Rocky Mountain juniper; Russian olive	common hackberry; eastern redcedar; green ash; honeylocust	Siberian elm	---
BfA: Beadle, stony-----	---	---	---	---	---
Stickney, stony-----	---	---	---	---	---
BfB: Beadle, stony-----	---	---	---	---	---
Stickney, stony-----	---	---	---	---	---
Bg: Bearden-----	Peking cotoneaster; redosier dogwood	American plum; common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine	golden willow	eastern cottonwood
Bk: Bearden-----	Peking cotoneaster; redosier dogwood	American plum; common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine	golden willow	eastern cottonwood
Tonka-----	---	---	---	---	---
Bo: Beotia-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Br: Beotia-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
Rondell-----	American plum; common lilac; Siberian peashrub; silver buffaloberry	eastern redcedar; Rocky Mountain juniper	common hackberry; green ash; ponderosa pine; Russian olive; Siberian elm	---	---
Bs: Beotia-----	Peking cotoneaster	American plum; common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; Manchurian crabapple; ponderosa pine	golden willow	eastern cottonwood
Winship-----	Peking cotoneaster	American plum; common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine; Siberian crabapple	golden willow	eastern cottonwood
Bt: Beotia-----	Peking cotoneaster	American plum; common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; Manchurian crabapple; ponderosa pine	golden willow	eastern cottonwood
Winship-----	Peking cotoneaster	American plum; common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine; Siberian crabapple	golden willow	eastern cottonwood
Bu: Bon-----	common lilac	American plum; Siberian peashrub	blue spruce; common hackberry; eastern redcedar; green ash; ponderosa pine; Russian mulberry	honeylocust	eastern cottonwood

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Bw: Bon, channeled-----	common lilac	American plum; Siberian peashrub	blue spruce; common hackberry; eastern redcedar; green ash; ponderosa pine; Russian mulberry	honeylocust	eastern cottonwood
BxD: Buse-----	---	---	---	---	---
Barnes-----	redosier dogwood	American plum; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
ByE: Buse, stony-----	---	---	---	---	---
Barnes, stony-----	---	---	---	---	---
BzE: Buse-----	---	---	---	---	---
Langhei-----	American plum; common lilac; honeysuckle; late lilac; Siberian peashrub	blue spruce; eastern redcedar	bur oak; green ash; red pine; Russian olive	Siberian elm	---
Ca: Cantown-----	common lilac; Siberian peashrub; silver buffaloberry	common chokecherry; eastern redcedar; Manchurian crabapple; Russian olive	green ash; ponderosa pine; Siberian crabapple	Siberian elm	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Ca: (cont.) Turton-----	common lilac; eastern redcedar; Rocky Mountain juniper; Russian olive; Siberian peashrub; silver buffaloberry	green ash; ponderosa pine; Siberian elm	---	---	---
Cf: Cavour-----	eastern redcedar; Rocky Mountain juniper; Siberian peashrub; silver buffaloberry	green ash; ponderosa pine; Russian olive; Siberian elm	---	---	---
Ferney-----	---	---	---	---	---
Co: Colvin, saline-----	Siberian peashrub; silver buffaloberry	---	green ash; Russian olive; Siberian elm	---	---
Cr: Cresbard-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
Cavour-----	eastern redcedar; Rocky Mountain juniper; Siberian peashrub; silver buffaloberry	green ash; ponderosa pine; Russian olive; Siberian elm	---	---	---
Cs: Cresbard-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Cs: (cont.)					
Cavour-----	eastern redcedar; Rocky Mountain juniper; Siberian peashrub; silver buffaloberry	green ash; ponderosa pine; Russian olive; Siberian elm	---	---	---
Heil-----	---	---	---	---	---
Ct:					
Crossplain-----	common lilac; Siberian peashrub	common chokecherry	common hackberry; eastern redcedar; green ash; ponderosa pine	golden willow; honeylocust; silver maple	eastern cottonwood
Tetonka-----	common lilac; Siberian peashrub	common chokecherry	common hackberry; eastern redcedar; green ash; ponderosa pine	golden willow; honeylocust; silver maple	eastern cottonwood
Da:					
Davis-----	common lilac	American plum; Siberian peashrub	blue spruce; common hackberry; eastern redcedar; green ash; ponderosa pine; Russian mulberry	honeylocust	eastern cottonwood
Northville-----	common lilac; Peking cotoneaster; Siberian peashrub	common chokecherry; Russian olive; silver buffaloberry	eastern redcedar; green ash; honeylocust; ponderosa pine; Siberian crabapple	Siberian elm	---
Db:					
Davison-----	common lilac	common chokecherry; Siberian peashrub	bur oak; common hackberry; eastern redcedar; green ash; honeylocust; ponderosa pine; Russian olive	Siberian elm	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Dd: Davison-----	common lilac	common chokecherry; Siberian peashrub	bur oak; common hackberry; eastern redcedar; green ash; honeylocust; ponderosa pine; Russian olive	Siberian elm	---
Tetanka-----	common lilac; Siberian peashrub	common chokecherry	common hackberry; eastern redcedar; green ash; ponderosa pine	golden willow; honeylocust; silver maple	eastern cottonwood
DeA: Delmont-----	common lilac; Peking cotoneaster; Siberian peashrub	Manchurian crabapple; ponderosa pine	bur oak; eastern redcedar; green ash; honeylocust; Rocky Mountain juniper; Russian olive	Siberian elm	---
Enet-----	common lilac; Peking cotoneaster; Siberian peashrub	eastern redcedar; Manchurian crabapple; ponderosa pine; Rocky Mountain juniper; Russian olive	bur oak; green ash; honeylocust	Siberian elm	---
Dk: Dimo-----	common lilac	American plum; Siberian peashrub	blue spruce; eastern redcedar; green ash; ponderosa pine; Russian mulberry	common hackberry; golden willow	eastern cottonwood
Dm: Dimo-----	common lilac	American plum; Siberian peashrub	blue spruce; eastern redcedar; green ash; ponderosa pine; Russian mulberry	common hackberry; golden willow	eastern cottonwood
Grat-----	---	---	---	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
DoA: Doland-----	redosier dogwood	American plum; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
Emlden-----	common lilac; Siberian peashrub; silver buffaloberry	common chokecherry; eastern redcedar; Manchurian crabapple	American plum; bur oak; green ash; ponderosa pine; Russian olive	---	---
Dq: Dovecreek-----	---	---	---	American plum; common chokecherry; Peking cotoneaster; Siberian peashrub	Black Hills spruce; eastern cottonwood; eastern redcedar; golden willow; green ash; Manchurian crabapple; ponderosa pine
Dr: Dovray-----	American plum; redosier dogwood; Siberian peashrub	common chokecherry; common lilac; eastern redcedar	Black Hills spruce; green ash; Siberian crabapple	golden willow	eastern cottonwood
Du: Dudley-----	common lilac; eastern redcedar; Rocky Mountain juniper; Siberian peashrub; silver buffaloberry	green ash; ponderosa pine; Russian olive; Siberian elm	---	---	---
Jerauld-----	---	---	---	---	---
Dx: Durrstein-----	---	---	---	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Ea: Eckman-----	redosier dogwood	American plum; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
EcA: Eckman-----	redosier dogwood	American plum; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
Gardena-----	Peking cotoneaster; redosier dogwood	American plum; common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine	golden willow	eastern cottonwood
EcB: Eckman-----	redosier dogwood	American plum; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
Gardena-----	Peking cotoneaster; redosier dogwood	American plum; common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine	golden willow	eastern cottonwood
EdB: Eckman-----	redosier dogwood	American plum; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
EdB: (cont.) Zell-----	common lilac; Peking cotoneaster; Rocky Mountain juniper; Siberian peashrub; silver buffaloberry; skunkbush sumac	eastern redcedar; green ash; ponderosa pine; Russian olive	Siberian elm	---	---
EeB: Edgeley-----	redosier dogwood	American plum; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
EeC: Edgeley-----	redosier dogwood	American plum; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
EeD: Edgeley-----	redosier dogwood	American plum; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
EgA: Egeland-----	common lilac; Siberian peashrub; silver buffaloberry	common chokecherry; eastern redcedar; Manchurian crabapple	American plum; bur oak; green ash; ponderosa pine; Russian olive	---	---
Embden-----	common lilac; Siberian peashrub; silver buffaloberry	common chokecherry; eastern redcedar; Manchurian crabapple	American plum; bur oak; green ash; ponderosa pine; Russian olive	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
EgB: Egeland-----	common lilac; Siberian peashrub; silver buffaloberry	common chokecherry; eastern redcedar; Manchurian crabapple	American plum; bur oak; green ash; ponderosa pine; Russian olive	---	---
Embden-----	common lilac; Siberian peashrub; silver buffaloberry	common chokecherry; eastern redcedar; Manchurian crabapple	American plum; bur oak; green ash; ponderosa pine; Russian olive	---	---
Ek: Elsmere-----	common lilac; Siberian peashrub	common chokecherry	common hackberry; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine	golden willow; honeylocust	eastern cottonwood
EmE: Ethan-----	---	---	---	---	---
Betts-----	---	---	---	---	---
EnD: Ethan-----	common lilac; Siberian peashrub; silver buffaloberry; skunkbush sumac	eastern redcedar; Rocky Mountain juniper	common hackberry; green ash; honeylocust; ponderosa pine; Russian olive; Siberian elm	---	---
Hand-----	common lilac	common chokecherry; Siberian peashrub	bur oak; common hackberry; eastern redcedar; green ash; honeylocust; ponderosa pine; Russian olive	Siberian elm	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Er:					
Exline-----	---	---	---	---	---
Aberdeen-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
Nahon-----	common lilac; eastern redcedar; Rocky Mountain juniper; Russian olive; Siberian peashrub; silver buffaloberry	green ash; ponderosa pine; Siberian elm	---	---	---
Et:					
Exline-----	---	---	---	---	---
Aberdeen-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
Nahon-----	common lilac; eastern redcedar; Rocky Mountain juniper; Russian olive; Siberian peashrub; silver buffaloberry	green ash; ponderosa pine; Siberian elm	---	---	---
Ew:					
Exline-----	---	---	---	---	---
Heil-----	---	---	---	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Ex:					
Exline-----	---	---	---	---	---
Heil-----	---	---	---	---	---
EyA:					
Exline-----	---	---	---	---	---
Putney-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
Fa:					
Farmsworth-----	common lilac; eastern redcedar; Rocky Mountain juniper; Siberian peashrub; silver buffaloberry	green ash; ponderosa pine; Russian olive; Siberian elm	---	---	---
Durrstein-----	---	---	---	---	---
Fe:					
Ferney-----	---	---	---	---	---
Heil-----	---	---	---	---	---
Ff:					
Forestburg-----	common lilac; Siberian peashrub; skunkbush sumac	Manchurian crabapple	common hackberry; eastern redcedar; green ash; honeylocust; ponderosa pine; Russian olive	Siberian elm	---
Elsmere-----	American plum; common lilac; Siberian peashrub	common chokecherry	blue spruce; common hackberry; eastern redcedar; green ash; ponderosa pine; Siberian crabapple	eastern cottonwood; golden willow	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Fh: Forestburg-----	common lilac; Siberian peashrub; skunkbush sumac	Manchurian crabapple	common hackberry; eastern redcedar; green ash; honeylocust; ponderosa pine; Russian olive	Siberian elm	---
Elsmere-----	American plum; common lilac; Siberian peashrub	common chokecherry	blue spruce; common hackberry; eastern redcedar; green ash; ponderosa pine; Siberian crabapple	eastern cottonwood; golden willow	---
Toko-----	---	---	---	---	---
FmA: Forman-----	redosier dogwood	American plum; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
Aastad-----	American plum; Peking cotoneaster	common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine; Siberian crabapple	golden willow	eastern cottonwood
FmB: Forman-----	redosier dogwood	American plum; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
Aastad-----	American plum; Peking cotoneaster	common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine; Siberian crabapple	golden willow	eastern cottonwood

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
FnC: Forman-----	redosier dogwood	American plum; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
Buse-----	common lilac; eastern redcedar; Rocky Mountain juniper; Siberian peashrub	ponderosa pine; Russian olive	green ash; Siberian elm	---	---
FrB: Forman-----	redosier dogwood	American plum; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
Buse-----	common lilac; eastern redcedar; Rocky Mountain juniper; Siberian peashrub	ponderosa pine; Russian olive	green ash; Siberian elm	---	---
Aastad-----	American plum; Peking cotoneaster	common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine; Siberian crabapple	golden willow	eastern cottonwood
FrC: Forman-----	redosier dogwood	American plum; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
FrC:(cont.) Buse-----	common lilac; eastern redcedar; Rocky Mountain juniper; Siberian peashrub	ponderosa pine; Russian olive	green ash; Siberian elm	---	---
Aastad-----	American plum; Peking cotoneaster; redosier dogwood	common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine	golden willow	eastern cottonwood
FsA: Forman-----	redosier dogwood	American plum; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
Cresbard-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
FsB: Forman-----	redosier dogwood	American plum; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
Cresbard-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
FtA: Forman-----	redosier dogwood	American plum; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
Cresbard-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
Tonka-----	---	---	---	---	---
Ga: Gardena-----	Peking cotoneaster; redosier dogwood	American plum; common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine	golden willow	eastern cottonwood
Gd: Gardena-----	Peking cotoneaster; redosier dogwood	American plum; common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine	golden willow	eastern cottonwood
Glyndon-----	common lilac	common chokecherry; eastern redcedar; Siberian peashrub	blue spruce; bur oak; Russian olive; white spruce	golden willow	eastern cottonwood; Siberian elm
Ge: Gardena-----	Peking cotoneaster; redosier dogwood	American plum; common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine	golden willow	eastern cottonwood

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Ge: (cont.) Turton-----	common lilac; eastern redcedar; Rocky Mountain juniper; Russian olive; Siberian peashrub; silver buffaloberry	green ash; ponderosa pine; Siberian elm	---	---	---
GgA: Great Bend-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
GnA: Great Bend-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
Beotia-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
GnB: Great Bend-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
GnB: (cont.) Beotia-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
GoA: Great Bend-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
Beotia-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
GpA: Great Bend-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
Putney-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
GpB: Great Bend-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
Putney-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
GtB: Great Bend-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
Zell-----	common lilac; Peking cotoneaster; Rocky Mountain juniper; Siberian peashrub; silver buffaloberry; skunkbush sumac	eastern redcedar; green ash; ponderosa pine; Russian olive	Siberian elm	---	---
GtC: Great Bend-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
GtC: (cont.) Zell-----	common lilac; Peking cotoneaster; Rocky Mountain juniper; Siberian peashrub; silver buffaloberry; skunkbush sumac	eastern redcedar; green ash; ponderosa pine; Russian olive	Siberian elm	---	---
GzC: Great Bend-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
Zell-----	common lilac; Peking cotoneaster; Rocky Mountain juniper; Siberian peashrub; silver buffaloberry; skunkbush sumac	eastern redcedar; green ash; ponderosa pine; Russian olive	Siberian elm	---	---
Huffton-----	eastern redcedar; Rocky Mountain juniper; Siberian peashrub	green ash; ponderosa pine; Russian olive	Siberian elm	---	---
HaA: Hamerly-----	Peking cotoneaster; redosier dogwood	American plum; common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine	golden willow	eastern cottonwood
Hb: Hamerly-----	Peking cotoneaster; redosier dogwood	American plum; common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine	golden willow	eastern cottonwood
Tonka-----	---	---	---	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
HcA: Hand-----	common lilac	common chokecherry; Siberian peashrub	bur oak; common hackberry; eastern redcedar; green ash; honeylocust; ponderosa pine; Russian olive	Siberian elm	---
Bonilla-----	common lilac	common chokecherry; Siberian peashrub	blue spruce; common hackberry; eastern redcedar; green ash; ponderosa pine; Russian mulberry	honeylocust	eastern cottonwood
HcB: Hand-----	common lilac	common chokecherry; Siberian peashrub	bur oak; common hackberry; eastern redcedar; green ash; honeylocust; ponderosa pine; Russian olive	Siberian elm	---
Bonilla-----	common lilac	common chokecherry; Siberian peashrub	blue spruce; common hackberry; eastern redcedar; green ash; ponderosa pine; Russian mulberry	honeylocust	eastern cottonwood
HdA: Hand-----	common lilac	common chokecherry; Siberian peashrub	bur oak; common hackberry; eastern redcedar; green ash; honeylocust; ponderosa pine; Russian olive	Siberian elm	---
Carthage-----	common lilac; Siberian peashrub; silver buffaloberry	American plum; common chokecherry; eastern redcedar; Manchurian crabapple	bur oak; green ash; ponderosa pine; Russian olive	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
He: Hand-----	common lilac	common chokecherry; Siberian peashrub	bur oak; common hackberry; eastern redcedar; green ash; honeylocust; ponderosa pine; Russian olive	Siberian elm	---
Carthage-----	common lilac; Siberian peashrub; silver buffaloberry	American plum; common chokecherry; eastern redcedar; Manchurian crabapple	bur oak; green ash; ponderosa pine; Russian olive	---	---
Overshue-----	---	---	---	---	---
HfC: Hand-----	common lilac	common chokecherry; Siberian peashrub	bur oak; common hackberry; eastern redcedar; green ash; honeylocust; ponderosa pine; Russian olive	Siberian elm	---
Ethan-----	common lilac; Siberian peashrub; silver buffaloberry; skunkbush sumac	eastern redcedar; Rocky Mountain juniper	common hackberry; green ash; honeylocust; ponderosa pine; Russian olive; Siberian elm	---	---
HgB: Hand-----	common lilac	common chokecherry; Siberian peashrub	bur oak; common hackberry; eastern redcedar; green ash; honeylocust; ponderosa pine; Russian olive	Siberian elm	---
Ethan-----	common lilac; Siberian peashrub; silver buffaloberry; skunkbush sumac	eastern redcedar; Rocky Mountain juniper	common hackberry; green ash; honeylocust; ponderosa pine; Russian olive; Siberian elm	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
HgB: (cont.) Bonilla-----	common lilac	common chokecherry; Siberian peashrub	blue spruce; common hackberry; eastern redcedar; green ash; ponderosa pine; Russian mulberry	honeylocust	eastern cottonwood
HgC: Hand-----	common lilac	common chokecherry; Siberian peashrub	bur oak; common hackberry; eastern redcedar; green ash; honeylocust; ponderosa pine; Russian olive	Siberian elm	---
Ethan-----	common lilac; Siberian peashrub; silver buffaloberry; skunkbush sumac	eastern redcedar; Rocky Mountain juniper	common hackberry; green ash; honeylocust; ponderosa pine; Russian olive; Siberian elm	---	---
Bonilla-----	common lilac	American plum; common chokecherry; Siberian peashrub	eastern redcedar; Siberian crabapple	blue spruce; common hackberry; golden willow; green ash; ponderosa pine	eastern cottonwood
HhB: Hand-----	common lilac	common chokecherry; Siberian peashrub	bur oak; common hackberry; eastern redcedar; green ash; honeylocust; ponderosa pine; Russian olive	Siberian elm	---
Ethan-----	common lilac; Siberian peashrub; silver buffaloberry; skunkbush sumac	eastern redcedar; Rocky Mountain juniper	common hackberry; green ash; honeylocust; ponderosa pine; Russian olive; Siberian elm	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
HhB: (cont.) Carthage-----	common lilac; Siberian peashrub; silver buffaloberry	American plum; common chokecherry; eastern redcedar; Manchurian crabapple	bur oak; green ash; ponderosa pine; Russian olive	---	---
HjB: Hand-----	common lilac	common chokecherry; Siberian peashrub	bur oak; common hackberry; eastern redcedar; green ash; honeylocust; ponderosa pine; Russian olive	Siberian elm	---
Talmo-----	---	---	---	---	---
HjC: Hand-----	common lilac	common chokecherry; Siberian peashrub	bur oak; common hackberry; eastern redcedar; green ash; honeylocust; ponderosa pine; Russian olive	Siberian elm	---
Talmo-----	---	---	---	---	---
Hk: Harmony-----	American plum; common lilac; Siberian peashrub	common chokecherry; eastern redcedar; Rocky Mountain juniper; Russian olive	green ash; ponderosa pine; Siberian elm	---	---
Aberdeen-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Hm: Harmony-----	American plum; common lilac; Siberian peashrub	common chokecherry; eastern redcedar; Rocky Mountain juniper; Russian olive	green ash; ponderosa pine; Siberian elm	---	---
Aberdeen-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
Hn: Harmony-----	American plum; common lilac; Siberian peashrub	common chokecherry; eastern redcedar; Rocky Mountain juniper; Russian olive	green ash; ponderosa pine; Siberian elm	---	---
Beotia-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
Ho: Harmony-----	American plum; common lilac; Siberian peashrub	common chokecherry; eastern redcedar; Rocky Mountain juniper; Russian olive	green ash; ponderosa pine; Siberian elm	---	---
Beotia-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Hp: Harriet-----	---	---	---	---	---
Hr: Heil-----	---	---	---	---	---
HsA: Henkin-----	common lilac; Siberian peashrub; skunkbush sumac	Manchurian crabapple	common hackberry; eastern redcedar; green ash; honeylocust; ponderosa pine; Russian olive	Siberian elm	---
Blendon-----	common lilac; Siberian peashrub; skunkbush sumac	Manchurian crabapple	common hackberry; eastern redcedar; green ash; honeylocust; ponderosa pine; Russian olive	Siberian elm	---
HsB: Henkin-----	common lilac; Siberian peashrub; skunkbush sumac	Manchurian crabapple	common hackberry; eastern redcedar; green ash; honeylocust; ponderosa pine; Russian olive	Siberian elm	---
Blendon-----	common lilac; Siberian peashrub; skunkbush sumac	Manchurian crabapple	common hackberry; eastern redcedar; green ash; honeylocust; ponderosa pine; Russian olive	Siberian elm	---
HtB: Houdek-----	common lilac	common chokecherry; Siberian peashrub	bur oak; common hackberry; eastern redcedar; green ash; honeylocust; ponderosa pine; Russian olive	Siberian elm	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
HtB: (cont.) Ethan-----	common lilac; Siberian peashrub; silver buffaloberry; skunkbush sumac	eastern redcedar; Rocky Mountain juniper	common hackberry; green ash; honeylocust; ponderosa pine; Russian olive; Siberian elm	---	---
Prosper-----	common lilac	American plum; Siberian peashrub	blue spruce; common hackberry; eastern redcedar; green ash; ponderosa pine; Russian mulberry	honeylocust	eastern cottonwood
HtC: Houdek-----	common lilac	common chokecherry; Siberian peashrub	bur oak; common hackberry; eastern redcedar; green ash; honeylocust; ponderosa pine; Russian olive	Siberian elm	---
Ethan-----	common lilac; Siberian peashrub; silver buffaloberry; skunkbush sumac	eastern redcedar; Rocky Mountain juniper	common hackberry; green ash; honeylocust; ponderosa pine; Russian olive; Siberian elm	---	---
Prosper-----	common lilac	American plum; Siberian peashrub	blue spruce; common hackberry; eastern redcedar; green ash; ponderosa pine; Russian mulberry	honeylocust	eastern cottonwood
HuA: Houdek-----	common lilac	common chokecherry; Siberian peashrub	bur oak; common hackberry; eastern redcedar; green ash; honeylocust; ponderosa pine; Russian olive	Siberian elm	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
HuA: (cont.) Prosper-----	common lilac	American plum; Siberian peashrub	blue spruce; common hackberry; eastern redcedar; green ash; ponderosa pine; Russian mulberry	honeylocust	eastern cottonwood
HuB: Houdek-----	common lilac	common chokecherry; Siberian peashrub	bur oak; common hackberry; eastern redcedar; green ash; honeylocust; ponderosa pine; Russian olive	Siberian elm	---
Prosper-----	common lilac	American plum; Siberian peashrub	blue spruce; common hackberry; eastern redcedar; green ash; ponderosa pine; Russian mulberry	honeylocust	eastern cottonwood
HwA: Houdek-----	common lilac	common chokecherry; Siberian peashrub	bur oak; common hackberry; eastern redcedar; green ash; honeylocust; ponderosa pine; Russian olive	Siberian elm	---
Stickney-----	common lilac; Siberian peashrub; skunkbush sumac	Manchurian crabapple; Rocky Mountain juniper; Russian olive	common hackberry; eastern redcedar; green ash; honeylocust	Siberian elm	---
HxA: Houdek-----	common lilac	common chokecherry; Siberian peashrub	bur oak; common hackberry; eastern redcedar; green ash; honeylocust; ponderosa pine; Russian olive	Siberian elm	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
HxA: (cont.) Stickney-----	common lilac; Siberian peashrub; skunkbush sumac	Manchurian crabapple; Rocky Mountain juniper; Russian olive	common hackberry; eastern redcedar; green ash; honeylocust	Siberian elm	---
Tetonka-----	common lilac; Siberian peashrub	common chokecherry	common hackberry; eastern redcedar; green ash; ponderosa pine	golden willow; honeylocust; silver maple	eastern cottonwood
Hy: Hoven-----	---	---	---	---	---
Ie: Ipage-----	common lilac; Siberian peashrub; skunkbush sumac	Manchurian crabapple	common hackberry; eastern redcedar; green ash; honeylocust; ponderosa pine; Russian olive	Siberian elm	---
Els-----	---	---	American plum; common lilac; Siberian peashrub	---	blue spruce; common hackberry; eastern cottonwood; eastern redcedar; golden willow; green ash; Manchurian crabapple; ponderosa pine
Shue-----	---	---	---	---	---
Jh: Jerauld-----	---	---	---	---	---
Hoven-----	---	---	---	---	---
KaA: Kranzburg-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
KaA: (cont.) Brookings-----	American plum; Peking cotoneaster	common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; Manchurian crabapple; ponderosa pine	golden willow	eastern cottonwood
KbB: Kranzburg-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
Brookings-----	American plum; Peking cotoneaster	common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; Manchurian crabapple; ponderosa pine	golden willow	eastern cottonwood
Buse-----	common lilac; eastern redcedar; Rocky Mountain juniper; Siberian peashrub	ponderosa pine; Russian olive	green ash; Siberian elm	---	---
KcA: Kranzburg-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
Cresbard-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
KtA: Kranzburg-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
Cresbard-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
Tonka-----	---	---	---	---	---
KzB: Kranzburg-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
Zell-----	common lilac; Peking cotoneaster; Rocky Mountain juniper; Siberian peashrub; silver buffaloberry; skunkbush sumac	eastern redcedar; green ash; ponderosa pine; Russian olive	Siberian elm	---	---
Aastad-----	American plum; Peking cotoneaster	common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine; Siberian crabapple	golden willow	eastern cottonwood
La: La Prairie-----	American plum; Peking cotoneaster	common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine; Siberian crabapple	golden willow	plains cottonwood

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Lc: La Prairie, channeled---	American plum; Peking cotoneaster	common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine; Siberian crabapple	golden willow	plains cottonwood
Holmquist, channeled----	---	---	---	---	---
Ld: LaDelle-----	American plum; Peking cotoneaster	common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; Manchurian crabapple; ponderosa pine	golden willow	eastern cottonwood
Le: LaDelle, channeled-----	American plum; Peking cotoneaster	common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; Manchurian crabapple; ponderosa pine	golden willow	eastern cottonwood
Lk: Lamo-----	common lilac; Siberian peashrub	common chokecherry	common hackberry; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine	golden willow; honeylocust	eastern cottonwood
Lm: Lamoure-----	American plum; redosier dogwood; Siberian peashrub	common chokecherry; common lilac; eastern redcedar	Black Hills spruce; green ash; Manchurian crabapple	golden willow	eastern cottonwood
Ln: Lawet-----	common lilac; Siberian peashrub	American plum; common chokecherry	common hackberry; eastern redcedar; green ash; ponderosa pine	honeylocust	eastern cottonwood
Lo: Lawet, wet-----	---	---	---	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Lp: Lawet-----	common lilac; Siberian peashrub	American plum; common chokecherry	common hackberry; eastern redcedar; green ash; ponderosa pine	honeylocust	eastern cottonwood
Davison-----	common lilac	common chokecherry; Siberian peashrub	bur oak; common hackberry; eastern redcedar; green ash; honeylocust; ponderosa pine; Russian olive	Siberian elm	---
LrA: Lehr-----	Siberian peashrub	eastern redcedar; green ash; ponderosa pine; Rocky Mountain juniper; Russian olive	Siberian elm	---	---
Bowdle-----	Siberian peashrub	eastern redcedar; green ash; ponderosa pine; Rocky Mountain juniper; Russian olive	Siberian elm	---	---
LrB: Lehr-----	Siberian peashrub	eastern redcedar; green ash; ponderosa pine; Rocky Mountain juniper; Russian olive	Siberian elm	---	---
Bowdle-----	Siberian peashrub	eastern redcedar; green ash; ponderosa pine; Rocky Mountain juniper; Russian olive	Siberian elm	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Ls: Lowe-----	American plum; redosier dogwood; Siberian peashrub	common chokecherry; common lilac; eastern redcedar	Black Hills spruce; green ash; Siberian crabapple	golden willow	eastern cottonwood
Lt: Ludden-----	common lilac; Siberian peashrub; silver buffaloberry	---	blue spruce; common hackberry; eastern redcedar; ponderosa pine; Siberian crabapple	golden willow; green ash	eastern cottonwood
Lu: Ludden-----	---	---	---	---	---
Lw: Ludden, wet-----	---	---	---	---	---
M-W: Miscellaneous water----	---	---	---	---	---
MaC: Maddock-----	common lilac; Siberian peashrub; silver buffaloberry	American plum; common chokecherry; eastern redcedar	bur oak; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
Egeland-----	common lilac; Siberian peashrub; silver buffaloberry	common chokecherry; eastern redcedar; Manchurian crabapple	American plum; bur oak; green ash; ponderosa pine; Russian olive	---	---
MdA: Max-----	---	American plum; common chokecherry; common lilac; eastern redcedar; Siberian peashrub	Black Hills spruce; bur oak; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
Arnegard-----	American plum; Peking cotoneaster	common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine; Siberian crabapple	golden willow	plains cottonwood

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
MdB: Max-----	---	American plum; common chokecherry; common lilac; eastern redcedar; Siberian peashrub	Black Hills spruce; bur oak; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
Arnegard-----	American plum; Peking cotoneaster	common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine; Siberian crabapple	golden willow	plains cottonwood
MgB: Max-----	---	American plum; common chokecherry; common lilac; eastern redcedar; Siberian peashrub	Black Hills spruce; bur oak; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
Arnegard-----	American plum; Peking cotoneaster	common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine; Siberian crabapple	golden willow	plains cottonwood
Zahl-----	eastern redcedar; Rocky Mountain juniper; Russian olive; Siberian peashrub	green ash; ponderosa pine	Siberian elm	---	---
MnB: Max-----	---	American plum; common chokecherry; common lilac; eastern redcedar; Siberian peashrub	Black Hills spruce; bur oak; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
Niobell-----	American plum; common lilac; golden currant; Siberian peashrub	common chokecherry; eastern redcedar; Rocky Mountain juniper; Russian olive	green ash; ponderosa pine; Siberian elm	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
MnB: (cont.) Noonan-----	eastern redcedar; green ash; ponderosa pine; Rocky Mountain juniper; Russian olive; Siberian peashrub; silver buffaloberry	Siberian elm	---	---	---
MxC: Max-----	---	American plum; common chokecherry; common lilac; eastern redcedar; Siberian peashrub	Black Hills spruce; bur oak; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
Zahl-----	eastern redcedar; Rocky Mountain juniper; Russian olive; Siberian peashrub	green ash; ponderosa pine	Siberian elm	---	---
Arnegard-----	American plum; Peking cotoneaster; Siberian peashrub	Black Hills spruce; common chokecherry; eastern redcedar; green ash; Siberian crabapple	golden willow; ponderosa pine	plains cottonwood	---
My: Miranda-----	---	---	---	---	---
Heil-----	---	---	---	---	---
Mz: Moritz-----	American plum; redosier dogwood	common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine	golden willow	cottonwood
Lowe-----	American plum; redosier dogwood; Siberian peashrub	common chokecherry; common lilac; eastern redcedar	Black Hills spruce; green ash; Siberian crabapple	golden willow	eastern cottonwood

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Na: Nahon-----	common lilac; eastern redcedar; Rocky Mountain juniper; Russian olive; Siberian peashrub; silver buffaloberry	green ash; ponderosa pine; Siberian elm	---	---	---
Aberdeen-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
Exline-----	---	---	---	---	---
Nb: Nahon-----	common lilac; eastern redcedar; Rocky Mountain juniper; Russian olive; Siberian peashrub; silver buffaloberry	green ash; ponderosa pine; Siberian elm	---	---	---
Aberdeen-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
Exline-----	---	---	---	---	---
Nc: Niobell-----	American plum; common lilac; golden currant; Siberian peashrub	common chokecherry; eastern redcedar; Rocky Mountain juniper; Russian olive	green ash; ponderosa pine; Siberian elm	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Nc: (cont.) Noonan-----	eastern redcedar; green ash; ponderosa pine; Rocky Mountain juniper; Russian olive; Siberian peashrub; silver buffaloberry	Siberian elm	---	---	---
Nd: Niobell-----	American plum; common lilac; golden currant; Siberian peashrub	common chokecherry; eastern redcedar; Rocky Mountain juniper; Russian olive	green ash; ponderosa pine; Siberian elm	---	---
Noonan-----	eastern redcedar; green ash; ponderosa pine; Rocky Mountain juniper; Russian olive; Siberian peashrub; silver buffaloberry	Siberian elm	---	---	---
Heil-----	---	---	---	---	---
NeA: Niobell-----	American plum; common lilac; golden currant; Siberian peashrub	common chokecherry; eastern redcedar; Rocky Mountain juniper; Russian olive	green ash; ponderosa pine; Siberian elm	---	---
Noonan-----	eastern redcedar; green ash; ponderosa pine; Rocky Mountain juniper; Russian olive; Siberian peashrub; silver buffaloberry	Siberian elm	---	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
NeA: (cont.) Max-----	---	American plum; common chokecherry; common lilac; eastern redcedar; Siberian peashrub	Black Hills spruce; bur oak; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
Nm: Noonan-----	eastern redcedar; green ash; ponderosa pine; Rocky Mountain juniper; Russian olive; Siberian peashrub; silver buffaloberry	Siberian elm	---	---	---
Miranda-----	---	---	---	---	---
Nr: Northville-----	common lilac; Peking cotoneaster; Siberian peashrub	common chokecherry; Russian olive; silver buffaloberry	eastern redcedar; green ash; honeylocust; ponderosa pine; Siberian crabapple	Siberian elm	---
Farmsworth-----	common lilac; eastern redcedar; Rocky Mountain juniper; Siberian peashrub; silver buffaloberry	green ash; ponderosa pine; Russian olive; Siberian elm	---	---	---
Nv: Northville-----	common lilac; Peking cotoneaster; Siberian peashrub	common chokecherry; Russian olive; silver buffaloberry	eastern redcedar; green ash; honeylocust; ponderosa pine; Siberian crabapple	Siberian elm	---
Farmsworth-----	common lilac; eastern redcedar; Rocky Mountain juniper; Siberian peashrub; silver buffaloberry	green ash; ponderosa pine; Russian olive; Siberian elm	---	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Nv: (cont.)					
Hoven-----	---	---	---	---	---
Ov:					
Overshue-----	---	---	---	---	---
Pa:					
Parnell-----	---	---	---	---	---
Pc:					
Parshall-----	American plum; Peking cotoneaster; Siberian peashrub	Black Hills spruce; common chokecherry; eastern redcedar; green ash; Siberian crabapple	golden willow; ponderosa pine	---	---
PeA:					
Peever-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
PgB:					
Peever-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
Buse-----	common lilac; eastern redcedar; Rocky Mountain juniper; Siberian peashrub	ponderosa pine; Russian olive	green ash; Siberian elm	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
PoA: Peever-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---
Cavour-----	eastern redcedar; Rocky Mountain juniper; Siberian peashrub; silver buffaloberry	green ash; ponderosa pine; Russian olive; Siberian elm	---	---	---
Fp: Pits, gravel and sand---	---	---	---	---	---
Pr: Playmoor-----	---	---	---	---	---
Py: Playmoor, channeled----	---	---	---	---	---
Lamoure, channeled-----	---	---	---	---	---
Ra: Ranslo-----	eastern redcedar; Rocky Mountain juniper; Siberian peashrub; silver buffaloberry	green ash; ponderosa pine; Russian olive; Siberian elm	---	---	---
Re: Ranslo-----	eastern redcedar; Rocky Mountain juniper; Siberian peashrub; silver buffaloberry	green ash; ponderosa pine; Russian olive; Siberian elm	---	---	---
Harriet-----	---	---	---	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
RfA:					
Renshaw-----	common chokecherry; common lilac; eastern redcedar; Rocky Mountain juniper; Siberian peashrub; silver buffaloberry	Siberian crabapple	green ash; ponderosa pine; Russian olive	---	---
Fordville-----	common chokecherry; common lilac; eastern redcedar; Rocky Mountain juniper; Siberian peashrub; silver buffaloberry	Russian olive; Siberian crabapple	green ash; ponderosa pine	---	---
RfB:					
Renshaw-----	common chokecherry; common lilac; eastern redcedar; Rocky Mountain juniper; Siberian peashrub; silver buffaloberry	Siberian crabapple	green ash; ponderosa pine; Russian olive	---	---
Fordville-----	common chokecherry; common lilac; eastern redcedar; Rocky Mountain juniper; Siberian peashrub; silver buffaloberry	Russian olive; Siberian crabapple	green ash; ponderosa pine	---	---
So:					
Southam-----	---	---	---	---	---
St:					
Stickney-----	common lilac; Siberian peashrub; skunkbush sumac	Manchurian crabapple; Rocky Mountain juniper; Russian olive	common hackberry; eastern redcedar; green ash; honeylocust	Siberian elm	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
St:(cont.) Dudley-----	common lilac; eastern redcedar; Rocky Mountain juniper; Siberian peashrub; silver buffaloberry	green ash; ponderosa pine; Russian olive; Siberian elm	---	---	---
Su: Stickney-----	common lilac; Siberian peashrub; skunkbush sumac	Manchurian crabapple; Rocky Mountain juniper; Russian olive	common hackberry; eastern redcedar; green ash; honeylocust	Siberian elm	---
Dudley-----	common lilac; eastern redcedar; Rocky Mountain juniper; Siberian peashrub; silver buffaloberry	green ash; ponderosa pine; Russian olive; Siberian elm	---	---	---
Hoven-----	---	---	---	---	---
Sw: Straw-----	American plum	Siberian peashrub; Tatarian honeysuckle	Black Hills spruce; blue spruce; eastern redcedar; ponderosa pine; Rocky Mountain juniper	American elm; green ash; Siberian elm	eastern cottonwood
Sx: Straw-----	---	---	---	---	---
TbE: Talmo, stony-----	---	---	---	---	---
Ethan, stony-----	---	---	---	---	---
Te: Tetonka-----	common lilac; Siberian peashrub	common chokecherry	common hackberry; eastern redcedar; green ash; ponderosa pine	golden willow; honeylocust; silver maple	eastern cottonwood

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Tk: Toko-----	---	---	---	---	---
Tm: Toko, wet-----	---	---	---	---	---
Tn: Tonka-----	---	---	---	---	---
To: Tonka-----	Siberian peashrub	common chokecherry; common lilac	---	green ash	golden willow; plains cottonwood
Rimlap-----	---	---	American plum; Siberian peashrub	common lilac	Black Hills spruce; common chokecherry; eastern cottonwood; eastern redcedar; golden willow; green ash; Manchurian crabapple
Us: Udorthents, silty-----	redosier dogwood	American plum; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
Va: Vallars-----	---	---	---	---	---
Hamerly-----	Peking cotoneaster; redosier dogwood	American plum; common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine	golden willow	eastern cottonwood

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
VgA: Vang-----	common chokecherry; common lilac; eastern redcedar; Rocky Mountain juniper; Siberian peashrub; silver buffaloberry	Russian olive; Siberian crabapple	green ash; ponderosa pine	---	---
W: Water-----	---	---	---	---	---
WaA: Williams-----	---	American plum; common chokecherry; common lilac; eastern redcedar; Siberian peashrub	Black Hills spruce; bur oak; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
Bowbells-----	American plum; Peking cotoneaster	common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine; Siberian crabapple	golden willow	plains cottonwood
WaB: Williams-----	---	American plum; common chokecherry; common lilac; eastern redcedar; Siberian peashrub	Black Hills spruce; bur oak; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
Bowbells-----	American plum; Peking cotoneaster	common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine; Siberian crabapple	golden willow	plains cottonwood
WbA: Williams-----	---	American plum; common chokecherry; common lilac; eastern redcedar; Siberian peashrub	Black Hills spruce; bur oak; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
WbA: (cont.)					
Bowbells-----	American plum; Peking cotoneaster	common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine; Siberian crabapple	golden willow	plains cottonwood
Tonka-----	Siberian peashrub	common chokecherry; common lilac	---	green ash	golden willow; plains cottonwood
WbB:					
Williams-----	---	American plum; common chokecherry; common lilac; eastern redcedar; Siberian peashrub	Black Hills spruce; bur oak; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
Bowbells-----	American plum; Peking cotoneaster	common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine; Siberian crabapple	golden willow	plains cottonwood
Tonka-----	Siberian peashrub	common chokecherry; common lilac	---	green ash	golden willow; plains cottonwood
WcA:					
Williams-----	---	American plum; common chokecherry; common lilac; eastern redcedar; Siberian peashrub	Black Hills spruce; bur oak; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
Niobell-----	American plum; common lilac; golden currant; Siberian peashrub	common chokecherry; eastern redcedar; Rocky Mountain juniper; Russian olive	green ash; ponderosa pine; Siberian elm	---	---
WcB:					
Williams-----	---	American plum; common chokecherry; common lilac; eastern redcedar; Siberian peashrub	Black Hills spruce; bur oak; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
WcB: (cont.) Niobell-----	American plum; common lilac; golden currant; Siberian peashrub	common chokecherry; eastern redcedar; Rocky Mountain juniper; Russian olive	green ash; ponderosa pine; Siberian elm	---	---
WdA: Williams-----	---	American plum; common chokecherry; common lilac; eastern redcedar; Siberian peashrub	Black Hills spruce; bur oak; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
Niobell-----	American plum; common lilac; golden currant; Siberian peashrub	common chokecherry; eastern redcedar; Rocky Mountain juniper; Russian olive	green ash; ponderosa pine; Siberian elm	---	---
Tonka-----	Siberian peashrub	common chokecherry; common lilac	---	green ash	golden willow; plains cottonwood
WhD: Williams-----	---	American plum; common chokecherry; common lilac; eastern redcedar; Siberian peashrub	Black Hills spruce; bur oak; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
Vida-----	---	common chokecherry; common lilac; eastern redcedar; Siberian peashrub; Tatarian honeysuckle	Black Hills spruce; bur oak; green ash; Manchurian crabapple; ponderosa pine; Russian olive	Siberian elm	---
WmB: Williams-----	---	American plum; common chokecherry; common lilac; eastern redcedar; Siberian peashrub	Black Hills spruce; bur oak; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
WmB: (cont.)					
Zahl-----	eastern redcedar; Rocky Mountain juniper; Russian olive; Siberian peashrub	green ash; ponderosa pine	Siberian elm	---	---
Bowbells-----	American plum; Peking cotoneaster	common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine; Siberian crabapple	golden willow	plains cottonwood
WmC:					
Williams-----	---	American plum; common chokecherry; common lilac; eastern redcedar; Siberian peashrub	Black Hills spruce; bur oak; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
Zahl-----	eastern redcedar; Rocky Mountain juniper; Russian olive; Siberian peashrub	green ash; ponderosa pine	Siberian elm	---	---
Bowbells-----	American plum; Peking cotoneaster	common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine; Siberian crabapple	golden willow	plains cottonwood
Wn:					
Winship-----	Peking cotoneaster	American plum; common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine; Siberian crabapple	golden willow	eastern cottonwood
Tonka-----	---	---	---	---	---
Wo:					
Winship-----	Peking cotoneaster	American plum; common chokecherry; eastern redcedar; Siberian peashrub	Black Hills spruce; green ash; ponderosa pine; Siberian crabapple	golden willow	eastern cottonwood
Tonka-----	---	---	---	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
Ws: Woonsocket-----	common lilac	American plum; common chokecherry; Siberian peashrub	eastern redcedar; Siberian crabapple	blue spruce; common hackberry; golden willow; green ash; ponderosa pine	eastern cottonwood
Whitelake-----	common lilac; Siberian peashrub; skunkbush sumac	Manchurian crabapple	common hackberry; eastern redcedar; green ash; honeylocust; ponderosa pine; Russian olive	Siberian elm	---
Wt: Worthing-----	common lilac; Siberian peashrub	common chokecherry	common hackberry; eastern redcedar; green ash; ponderosa pine	golden willow; honeylocust; silver maple	eastern cottonwood
Ww: Worthing, ponded-----	---	---	---	---	---
ZaE: Zahill-----	---	---	---	---	---
ZbC: Zahl-----	eastern redcedar; Rocky Mountain juniper; Russian olive; Siberian peashrub	green ash; ponderosa pine	Siberian elm	---	---
Max-----	---	American plum; common chokecherry; common lilac; eastern redcedar; Siberian peashrub	Black Hills spruce; bur oak; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
ZbD: Zahl-----	---	---	---	---	---
Max-----	---	American plum; common chokecherry; common lilac; eastern redcedar; Siberian peashrub	Black Hills spruce; bur oak; green ash; ponderosa pine; Russian olive; Siberian crabapple	---	---
ZgD: Zell-----	---	---	---	---	---
Great Bend-----	---	American plum; common chokecherry; common lilac; Siberian peashrub	Black Hills spruce; bur oak; eastern redcedar; green ash; Manchurian crabapple; ponderosa pine; Russian olive	---	---

Camp Areas, Picnic Areas, and Playgrounds

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Aa:							
Aastad-----	85	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15
Ab:							
Aastad-----	50	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15
Hamerly-----	35	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15
Ad:							
Aastad-----	60	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15
Tonka-----	30	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.94	Very limited Ponding Depth to saturated zone Slow water movement	1.00 1.00 0.94	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.94
Ae:							
Aberdeen-----	55	Somewhat limited Slow water movement	0.94	Somewhat limited Slow water movement	0.94	Somewhat limited Slow water movement	0.94
Nahon-----	35	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Slow water movement Sodium content	1.00 1.00
Ah:							
Aberdeen-----	55	Somewhat limited Slow water movement	0.94	Somewhat limited Slow water movement	0.94	Somewhat limited Slow water movement	0.94
Nahon-----	35	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Slow water movement Sodium content	1.00 1.00
An:							
Aberdeen-----	45	Somewhat limited Slow water movement	0.94	Somewhat limited Slow water movement	0.94	Somewhat limited Slow water movement	0.94

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
An: (cont.)							
Nahon-----	25	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Slow water movement Sodium content	1.00 1.00
Heil-----	20	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00
Ao:							
Aberdeen-----	45	Somewhat limited Slow water movement	0.94	Somewhat limited Slow water movement	0.94	Somewhat limited Slow water movement	0.94
Nahon-----	25	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Slow water movement Sodium content	1.00 1.00
Heil-----	20	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00
At:							
Aguents, loamy-----	90	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
BaC:							
Beadle-----	80	Somewhat limited Slow water movement Slope	0.05 0.01	Somewhat limited Slow water movement Slope	0.05 0.01	Very limited Slope Slow water movement	1.00 0.05
BdA:							
Beadle-----	50	Somewhat limited Slow water movement	0.05	Somewhat limited Slow water movement	0.05	Somewhat limited Slow water movement	0.05
Dudley-----	35	Very limited Sodium content Slow water movement	1.00 0.45	Very limited Sodium content Slow water movement	1.00 0.45	Very limited Sodium content Slow water movement	1.00 0.45
BeA:							
Beadle-----	60	Somewhat limited Slow water movement	0.05	Somewhat limited Slow water movement	0.05	Somewhat limited Slow water movement	0.05

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BeA: (cont.) Stickney-----	30	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39
BeB: Beadle-----	60	Somewhat limited Slow water movement	0.05	Somewhat limited Slow water movement	0.05	Somewhat limited Slope Slow water movement	0.50 0.05
Stickney-----	30	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39
BfA: Beadle, stony-----	60	Somewhat limited Large stones content Slow water movement	0.53 0.05	Somewhat limited Large stones content Slow water movement	0.53 0.05	Somewhat limited Large stones content Slow water movement	0.53 0.05
Stickney, stony-----	30	Somewhat limited Large stones content Slow water movement	0.53 0.39	Somewhat limited Large stones content Slow water movement	0.53 0.39	Somewhat limited Large stones content Slow water movement	0.53 0.39
BfB: Beadle, stony-----	60	Somewhat limited Large stones content Slow water movement	0.53 0.05	Somewhat limited Large stones content Slow water movement	0.53 0.05	Somewhat limited Large stones content Slope Slow water movement	0.53 0.50 0.05
Stickney, stony-----	30	Somewhat limited Large stones content Slow water movement	0.53 0.39	Somewhat limited Large stones content Slow water movement	0.53 0.39	Somewhat limited Large stones content Slow water movement	0.53 0.39
Bg: Bearden-----	85	Not limited		Not limited		Not limited	
Bk: Bearden-----	60	Not limited		Not limited		Not limited	
Tonka-----	30	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.94	Very limited Ponding Depth to saturated zone Slow water movement	1.00 1.00 0.94	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.94

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Bo:							
Beotia-----	90	Not limited		Not limited		Not limited	
Br:							
Beotia-----	50	Not limited		Not limited		Not limited	
Rondell-----	35	Not limited		Not limited		Not limited	
Bs:							
Beotia-----	60	Not limited		Not limited		Not limited	
Winship-----	30	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15
Bt:							
Beotia-----	60	Not limited		Not limited		Not limited	
Winship-----	30	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15
Bu:							
Bon-----	90	Very limited Flooding	1.00	Not limited		Not limited	
Bw:							
Bon, channeled-----	85	Very limited Flooding	1.00	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
BxD:							
Buse-----	55	Very limited Slope Slow water movement	1.00 0.15	Very limited Slope Slow water movement	1.00 0.15	Very limited Slope Slow water movement	1.00 0.15
Barnes-----	35	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
ByE:							
Buse, stony-----	50	Very limited Slope Large stones content Slow water movement	1.00 0.53 0.15	Very limited Slope Large stones content Slow water movement	1.00 0.53 0.15	Very limited Slope Large stones content Slow water movement	1.00 0.53 0.15
Barnes, stony-----	35	Very limited Slope Large stones content Slow water movement	1.00 0.53 0.15	Very limited Slope Large stones content Slow water movement	1.00 0.53 0.15	Very limited Slope Large stones content Slow water movement	1.00 0.53 0.15
BzE:							
Buse-----	50	Very limited Slope Slow water movement	1.00 0.15	Very limited Slope Slow water movement	1.00 0.15	Very limited Slope Slow water movement	1.00 0.15

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BzE: (cont.) Langhei-----	40	Very limited Slope Slow water movement	1.00 0.15	Very limited Slope Slow water movement	1.00 0.15	Very limited Slope Slow water movement	1.00 0.15
Ca: Camtown-----	55	Very limited Sodium content Slow water movement	1.00 0.94	Very limited Sodium content Slow water movement	1.00 0.94	Very limited Sodium content Slow water movement	1.00 0.94
Turton-----	30	Very limited Sodium content Slow water movement	1.00 0.94	Very limited Sodium content Slow water movement	1.00 0.94	Very limited Sodium content Slow water movement	1.00 0.94
Cf: Cavour-----	55	Very limited Sodium content Slow water movement	1.00 1.00	Very limited Sodium content Slow water movement	1.00 1.00	Very limited Sodium content Slow water movement	1.00 1.00
Ferney-----	35	Very limited Sodium content Slow water movement	1.00 1.00	Very limited Sodium content Slow water movement	1.00 1.00	Very limited Sodium content Slow water movement	1.00 1.00
Co: Colvin, saline-----	85	Very limited Depth to saturated zone Ponding Salinity Slow water movement	1.00 1.00 1.00 0.15	Very limited Ponding Depth to saturated zone Salinity Slow water movement	1.00 1.00 1.00 0.15	Very limited Depth to saturated zone Ponding Salinity Slow water movement	1.00 1.00 1.00 0.15
Cr: Cresbard-----	60	Somewhat limited Slow water movement	0.60	Somewhat limited Slow water movement	0.60	Somewhat limited Slow water movement	0.60
Cavour-----	30	Very limited Sodium content Slow water movement	1.00 1.00	Very limited Sodium content Slow water movement	1.00 1.00	Very limited Sodium content Slow water movement	1.00 1.00
Cs: Cresbard-----	40	Somewhat limited Slow water movement	0.60	Somewhat limited Slow water movement	0.60	Somewhat limited Slow water movement	0.60
Cavour-----	30	Very limited Sodium content Slow water movement	1.00 1.00	Very limited Sodium content Slow water movement	1.00 1.00	Very limited Sodium content Slow water movement	1.00 1.00

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Cs: (cont.)							
Heil-----	20	Very limited		Very limited		Very limited	
		Depth to	1.00	Depth to	1.00	Depth to	1.00
		saturated zone		saturated zone		saturated zone	
		Slow water	1.00	Slow water	1.00	Slow water	1.00
		movement		movement		movement	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
Ct:							
Crossplain-----	60	Very limited		Very limited		Very limited	
		Depth to	1.00	Depth to	0.99	Depth to	1.00
		saturated zone		saturated zone		saturated zone	
		Flooding	1.00	Slow water	0.60	Flooding	1.00
		Slow water	0.60	movement		Slow water	0.60
		movement		Flooding	0.40	movement	
Tetonka-----	30	Very limited		Very limited		Very limited	
		Depth to	1.00	Depth to	1.00	Depth to	1.00
		saturated zone		saturated zone		saturated zone	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Slow water	0.94	Slow water	0.94	Slow water	0.94
		movement		movement		movement	
Da:							
Davis-----	55	Very limited		Not limited		Not limited	
		Flooding	1.00				
Northville-----	35	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Slow water	0.39	Slow water	0.39
		Slow water	0.39	movement		movement	
		movement					
Db:							
Davison-----	85	Not limited		Not limited		Not limited	
Dd:							
Davison-----	50	Not limited		Not limited		Not limited	
Tetonka-----	40	Very limited		Very limited		Very limited	
		Depth to	1.00	Depth to	1.00	Depth to	1.00
		saturated zone		saturated zone		saturated zone	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Slow water	0.94	Slow water	0.94	Slow water	0.94
		movement		movement		movement	
DeA:							
Delmont-----	55	Not limited		Not limited		Not limited	
Enet-----	35	Not limited		Not limited		Not limited	
Dk:							
Dimo-----	85	Very limited		Not limited		Not limited	
		Flooding	1.00				

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Dm: Dimo-----	55	Very limited Flooding Depth to saturated zone	1.00 0.07	Somewhat limited Depth to saturated zone	0.03	Somewhat limited Depth to saturated zone	0.07
Grat-----	30	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.94	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.94	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.94
DoA: Doland-----	50	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15
Embden-----	30	Not limited		Not limited		Not limited	
Dq: Dovecreek-----	90	Very limited Flooding	1.00	Not limited		Not limited	
Dr: Dovray-----	90	Very limited Depth to saturated zone Ponding Too clayey Slow water movement	1.00 1.00 1.00 0.60	Very limited Ponding Depth to saturated zone Too clayey Slow water movement	1.00 1.00 1.00 0.60	Very limited Depth to saturated zone Ponding Too clayey Slow water movement	1.00 1.00 1.00 0.60
Du: Dudley-----	55	Very limited Sodium content Slow water movement	1.00 0.45	Very limited Sodium content Slow water movement	1.00 0.45	Very limited Sodium content Slow water movement	1.00 0.45
Jerauld-----	35	Very limited Sodium content Slow water movement	1.00 0.45	Very limited Sodium content Slow water movement	1.00 0.45	Very limited Sodium content Slow water movement	1.00 0.45
Dx: Durrstein-----	85	Very limited Depth to saturated zone Sodium content Flooding Slow water movement Salinity	1.00 1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Sodium content Slow water movement Salinity Flooding	1.00 1.00 1.00 1.00 0.40	Very limited Depth to saturated zone Sodium content Flooding Slow water movement Salinity	1.00 1.00 1.00 1.00 1.00
Ea: Eckman-----	85	Not limited		Not limited		Not limited	

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
EcA:							
Eckman-----	50	Not limited		Not limited		Not limited	
Gardena-----	40	Not limited		Not limited		Not limited	
EcB:							
Eckman-----	60	Not limited		Not limited		Somewhat limited Slope	0.50
Gardena-----	30	Not limited		Not limited		Somewhat limited Slope	0.12
EdB:							
Eckman-----	60	Not limited		Not limited		Somewhat limited Slope	0.50
Zell-----	30	Not limited		Not limited		Somewhat limited Slope	0.50
EeB:							
Edgeley-----	85	Very limited Slow water movement	1.00	Very limited Slow water movement	1.00	Very limited Slow water movement Slope Depth to bedrock	1.00 0.50 0.42
EeC:							
Edgeley-----	85	Very limited Slow water movement Slope	1.00 0.01	Very limited Slow water movement Slope	1.00 0.01	Very limited Slope Slow water movement Depth to bedrock	1.00 1.00 0.42
EeD:							
Edgeley-----	85	Very limited Slow water movement Slope	1.00 1.00	Very limited Slow water movement Slope	1.00 1.00	Very limited Slope Slow water movement Depth to bedrock	1.00 1.00 0.42
EgA:							
Egeland-----	50	Not limited		Not limited		Not limited	
Embden-----	40	Not limited		Not limited		Not limited	
EgB:							
Egeland-----	50	Not limited		Not limited		Somewhat limited Slope	0.50
Embden-----	35	Not limited		Not limited		Somewhat limited Slope	0.50
Ek:							
Elsmere-----	85	Somewhat limited Too sandy Depth to saturated zone	0.84 0.07	Somewhat limited Too sandy Depth to saturated zone	0.84 0.03	Somewhat limited Too sandy Depth to saturated zone	0.84 0.07

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
EmE:							
Ethan-----	50	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Betts-----	40	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
EnD:							
Ethan-----	55	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Hand-----	35	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
Er:							
Exline-----	50	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Slow water movement Sodium content	1.00 1.00
Aberdeen-----	25	Somewhat limited Slow water movement	0.94	Somewhat limited Slow water movement	0.94	Somewhat limited Slow water movement	0.94
Nahon-----	20	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Slow water movement Sodium content	1.00 1.00
Et:							
Exline-----	50	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Slow water movement Sodium content	1.00 1.00
Aberdeen-----	25	Somewhat limited Slow water movement	0.94	Somewhat limited Slow water movement	0.94	Somewhat limited Slow water movement	0.94
Nahon-----	20	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Slow water movement Sodium content	1.00 1.00
Ew:							
Exline-----	50	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Slow water movement Sodium content	1.00 1.00
Heil-----	40	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ex:							
Exline-----	50	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Slow water movement Sodium content	1.00 1.00
Heil-----	40	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00
EyA:							
Exline-----	45	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Slow water movement Sodium content	1.00 1.00
Putney-----	40	Not limited		Not limited		Somewhat limited Slope	0.12
Fa:							
Farmsworth-----	50	Very limited Flooding Sodium content Slow water movement Depth to saturated zone	1.00 1.00 0.45 0.07	Very limited Sodium content Slow water movement Depth to saturated zone	1.00 0.45 0.03	Very limited Sodium content Slow water movement Depth to saturated zone	1.00 0.45 0.07
Durrstein-----	35	Very limited Depth to saturated zone Sodium content Flooding Slow water movement Salinity	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Sodium content Slow water movement Salinity Flooding	1.00 1.00 1.00 1.00 0.40	Very limited Depth to saturated zone Sodium content Flooding Slow water movement Salinity	1.00 1.00 1.00 1.00
Fe:							
Ferney-----	50	Very limited Sodium content Slow water movement	1.00 1.00	Very limited Sodium content Slow water movement	1.00 1.00	Very limited Sodium content Slow water movement	1.00 1.00
Heil-----	40	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00
Ff:							
Forestburg-----	60	Somewhat limited Too sandy	0.79	Somewhat limited Too sandy	0.79	Somewhat limited Too sandy	0.79

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ff: (cont.) Elsmere-----	30	Somewhat limited Too sandy Depth to saturated zone	0.84 0.39	Somewhat limited Too sandy Depth to saturated zone	0.84 0.19	Somewhat limited Too sandy Depth to saturated zone	0.84 0.39
Fh: Forestburg-----	45	Somewhat limited Too sandy	0.79	Somewhat limited Too sandy	0.79	Somewhat limited Too sandy	0.79
Elsmere-----	25	Somewhat limited Too sandy Depth to saturated zone	0.84 0.39	Somewhat limited Too sandy Depth to saturated zone	0.84 0.19	Somewhat limited Too sandy Depth to saturated zone	0.84 0.39
Toko-----	20	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.15	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.15	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.15
FmA: Forman-----	50	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15
Aastad-----	40	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15
FmB: Forman-----	60	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slope Slow water movement	0.88 0.15
Aastad-----	30	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15
FnC: Forman-----	55	Somewhat limited Slow water movement Slope	0.15 0.01	Somewhat limited Slow water movement Slope	0.15 0.01	Very limited Slope Slow water movement	1.00 0.15
Buse-----	35	Somewhat limited Slow water movement Slope	0.15 0.01	Somewhat limited Slow water movement Slope	0.15 0.01	Very limited Slope Slow water movement	1.00 0.15
FrB: Forman-----	50	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slope Slow water movement	0.50 0.15

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FrB: (cont.)							
Buse-----	25	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slope Slow water movement	0.88 0.15
Aastad-----	20	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15
FrC:							
Forman-----	45	Somewhat limited Slow water movement Slope	0.15 0.01	Somewhat limited Slow water movement Slope	0.15 0.01	Very limited Slope Slow water movement	1.00 0.15
Buse-----	30	Somewhat limited Slow water movement Slope	0.15 0.01	Somewhat limited Slow water movement Slope	0.15 0.01	Very limited Slope Slow water movement	1.00 0.15
Aastad-----	20	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slope Slow water movement	0.50 0.15
FsA:							
Forman-----	55	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15
Cresbard-----	30	Somewhat limited Slow water movement	0.60	Somewhat limited Slow water movement	0.60	Somewhat limited Slow water movement	0.60
FsB:							
Forman-----	60	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slope Slow water movement	0.50 0.15
Cresbard-----	30	Somewhat limited Slow water movement	0.60	Somewhat limited Slow water movement	0.60	Somewhat limited Slow water movement Slope	0.60 0.50
FtA:							
Forman-----	45	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15
Cresbard-----	25	Somewhat limited Slow water movement	0.60	Somewhat limited Slow water movement	0.60	Somewhat limited Slow water movement	0.60

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FtA: (cont.)							
Tonka-----	20	Very limited Depth to saturated zone	1.00	Very limited Ponding Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Ponding	1.00		1.00	Ponding	1.00
		Slow water movement	0.94	Slow water movement	0.94	Slow water movement	0.94
Ga:							
Gardena-----	90	Not limited		Not limited		Not limited	
Gd:							
Gardena-----	55	Not limited		Not limited		Not limited	
Glyndon-----	35	Not limited		Not limited		Not limited	
Ge:							
Gardena-----	50	Not limited		Not limited		Not limited	
Turton-----	35	Very limited Sodium content	1.00	Very limited Sodium content	1.00	Very limited Sodium content	1.00
		Slow water movement	0.94	Slow water movement	0.94	Slow water movement	0.94
GgA:							
Great Bend-----	90	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15
GnA:							
Great Bend-----	50	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15
Beotia-----	40	Not limited		Not limited		Not limited	
GnB:							
Great Bend-----	60	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slope Slow water movement	0.50 0.15
Beotia-----	30	Not limited		Not limited		Not limited	
GoA:							
Great Bend-----	50	Not limited		Not limited		Not limited	
Beotia-----	40	Not limited		Not limited		Not limited	
GpA:							
Great Bend-----	50	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15
Putney-----	35	Not limited		Not limited		Not limited	

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GpB: Great Bend-----	50	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement Slope	0.15 0.12
Putney-----	35	Not limited		Not limited		Somewhat limited Slope	0.12
GtB: Great Bend-----	60	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slope Slow water movement	0.50 0.15
Zell-----	30	Not limited		Not limited		Somewhat limited Slope	0.50
GtC: Great Bend-----	50	Somewhat limited Slow water movement Slope	0.15 0.01	Somewhat limited Slow water movement Slope	0.15 0.01	Very limited Slope Slow water movement	1.00 0.15
Zell-----	40	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Very limited Slope	1.00
GzC: Great Bend-----	45	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Very limited Slope Slow water movement	1.00 0.15
Zell-----	25	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Very limited Slope	1.00
Huffton-----	20	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Very limited Slope	1.00
HaA: Hamerly-----	85	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15
Hb: Hamerly-----	50	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15
Tonka-----	40	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.94	Very limited Ponding Depth to saturated zone Slow water movement	1.00 1.00 0.94	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.94
HcA: Hand-----	50	Not limited		Not limited		Not limited	
Bonilla-----	40	Not limited		Not limited		Not limited	

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HcB:							
Hand-----	60	Not limited		Not limited		Somewhat limited Slope	0.50
Bonilla-----	30	Not limited		Not limited		Not limited	
HdA:							
Hand-----	50	Not limited		Not limited		Not limited	
Carthage-----	40	Not limited		Not limited		Not limited	
He:							
Hand-----	45	Not limited		Not limited		Not limited	
Carthage-----	25	Not limited		Not limited		Not limited	
Overshue-----	20	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
HfC:							
Hand-----	55	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Very limited Slope	1.00
Ethan-----	35	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Very limited Slope	1.00
HgB:							
Hand-----	50	Not limited		Not limited		Somewhat limited Slope	0.50
Ethan-----	25	Not limited		Not limited		Somewhat limited Slope	0.50
Bonilla-----	20	Not limited		Not limited		Not limited	
HgC:							
Hand-----	45	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Very limited Slope	1.00
Ethan-----	30	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Very limited Slope	1.00
Bonilla-----	20	Not limited		Not limited		Somewhat limited Slope	0.50
HhB:							
Hand-----	50	Not limited		Not limited		Somewhat limited Slope	0.50
Ethan-----	25	Not limited		Not limited		Somewhat limited Slope	0.50
Carthage-----	20	Not limited		Not limited		Not limited	

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HjB: Hand-----	45	Not limited		Not limited		Somewhat limited Slope	0.50
Talmo-----	35	Not limited		Not limited		Somewhat limited Gravel content Slope	0.91 0.50
HjC: Hand-----	45	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Very limited Slope	1.00
Talmo-----	35	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Very limited Slope Gravel content	1.00 0.91
Hk: Harmony-----	55	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15
Aberdeen-----	35	Somewhat limited Slow water movement	0.94	Somewhat limited Slow water movement	0.94	Somewhat limited Slow water movement	0.94
Hm: Harmony-----	55	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15
Aberdeen-----	35	Somewhat limited Slow water movement	0.94	Somewhat limited Slow water movement	0.94	Somewhat limited Slow water movement	0.94
Hn: Harmony-----	55	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15
Beotia-----	35	Not limited		Not limited		Not limited	
Ho: Harmony-----	55	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15
Beotia-----	35	Not limited		Not limited		Not limited	
Hp: Harriet-----	90	Very limited Depth to saturated zone Sodium content Flooding Slow water movement	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Sodium content Slow water movement	1.00 1.00 1.00	Very limited Depth to saturated zone Sodium content Slow water movement Flooding	1.00 1.00 1.00 0.60

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Hr:							
Heil-----	90	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00
HsA:							
Henkin-----	55	Not limited		Not limited		Not limited	
Blendon-----	35	Not limited		Not limited		Not limited	
HsB:							
Henkin-----	60	Not limited		Not limited		Somewhat limited Slope	0.50
Blendon-----	30	Not limited		Not limited		Somewhat limited Slope	0.50
HtB:							
Houdek-----	50	Not limited		Not limited		Somewhat limited Slope	0.50
Ethan-----	25	Not limited		Not limited		Somewhat limited Slope	0.50
Prosper-----	20	Not limited		Not limited		Not limited	
HtC:							
Houdek-----	45	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Very limited Slope	1.00
Ethan-----	30	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Very limited Slope	1.00
Prosper-----	20	Not limited		Not limited		Somewhat limited Slope	0.50
HuA:							
Houdek-----	50	Not limited		Not limited		Not limited	
Prosper-----	40	Not limited		Not limited		Not limited	
HuB:							
Houdek-----	60	Not limited		Not limited		Somewhat limited Slope	0.50
Prosper-----	30	Not limited		Not limited		Not limited	
HwA:							
Houdek-----	55	Not limited		Not limited		Not limited	
Stickney-----	35	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HxA:							
Houdek-----	45	Not limited		Not limited		Not limited	
Stickney-----	25	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39
Tetonka-----	20	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.94	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.94	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.94
Hy:							
Hoven-----	90	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00
Ie:							
Ipage-----	45	Very limited Too sandy	1.00	Very limited Too sandy	1.00	Very limited Too sandy Slope	1.00 0.50
Els-----	25	Very limited Too sandy Depth to saturated zone	1.00 0.07	Very limited Too sandy Depth to saturated zone	1.00 0.03	Very limited Too sandy Depth to saturated zone	1.00 0.07
Shue-----	20	Very limited Depth to saturated zone Ponding Too sandy Slow water movement	1.00 1.00 0.92 0.15	Very limited Depth to saturated zone Ponding Too sandy Slow water movement	1.00 1.00 0.92 0.15	Very limited Depth to saturated zone Ponding Too sandy Slow water movement	1.00 1.00 0.92 0.15
Jh:							
Jerauld-----	50	Very limited Sodium content Slow water movement	1.00 0.45	Very limited Sodium content Slow water movement	1.00 0.45	Very limited Sodium content Slow water movement	1.00 0.45
Hoven-----	40	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00
KaA:							
Kranzburg-----	50	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KaA: (cont.) Brookings-----	40	Not limited		Not limited		Not limited	
KbB: Kranzburg-----	40	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slope Slow water movement	0.50 0.15
Brookings-----	30	Not limited		Not limited		Not limited	
Buse-----	25	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slope Slow water movement	0.88 0.15
KcA: Kranzburg-----	55	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15
Cresbard-----	30	Somewhat limited Slow water movement	0.60	Somewhat limited Slow water movement	0.60	Somewhat limited Slow water movement	0.60
KtA: Kranzburg-----	45	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15
Cresbard-----	25	Somewhat limited Slow water movement	0.60	Somewhat limited Slow water movement	0.60	Somewhat limited Slow water movement	0.60
Tonka-----	20	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.94	Very limited Ponding Depth to saturated zone Slow water movement	1.00 1.00 0.94	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.94
KzB: Kranzburg-----	40	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slope Slow water movement	0.50 0.15
Zell-----	30	Not limited		Not limited		Somewhat limited Slope	0.50
Aastad-----	20	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15
La: La Prairie-----	85	Very limited Flooding	1.00	Not limited		Not limited	

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Lc: La Prairie, channeled-----	50	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
Holmquist, channeled-----	40	Very limited Depth to saturated zone Flooding	1.00 1.00	Very limited Depth to saturated zone Flooding	0.99 0.40	Very limited Depth to saturated zone Flooding	1.00 1.00
Ld: LaDelle-----	90	Very limited Flooding	1.00	Not limited		Not limited	
Le: LaDelle, channeled--	85	Very limited Flooding	1.00	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
Lk: Lamo-----	90	Very limited Flooding Depth to saturated zone Slow water movement	1.00 0.39 0.15	Somewhat limited Depth to saturated zone Slow water movement	0.19 0.15	Somewhat limited Flooding Depth to saturated zone Slow water movement	0.60 0.39 0.15
Lm: Lamoure-----	85	Very limited Depth to saturated zone Flooding	1.00 1.00	Very limited Depth to saturated zone Flooding	0.99 0.40	Very limited Depth to saturated zone Flooding	1.00 1.00
Ln: Lawet-----	85	Very limited Flooding Depth to saturated zone	1.00 0.98	Somewhat limited Depth to saturated zone	0.75	Somewhat limited Depth to saturated zone Flooding	0.98 0.60
Lo: Lawet, wet-----	90	Very limited Depth to saturated zone Flooding Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding Flooding	1.00 1.00 0.60
Lp: Lawet-----	60	Very limited Flooding Depth to saturated zone	1.00 0.98	Somewhat limited Depth to saturated zone	0.75	Somewhat limited Depth to saturated zone Flooding	0.98 0.60
Davison-----	30	Not limited		Not limited		Not limited	
LrA: Lehr-----	55	Not limited		Not limited		Not limited	
Bowdle-----	35	Not limited		Not limited		Not limited	

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LrB: Lehr-----	60	Not limited		Not limited		Somewhat limited Slope	0.88
Bowdle-----	30	Not limited		Not limited		Somewhat limited Slope	0.50
Ls: Lowe-----	85	Very limited Depth to saturated zone Flooding	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Flooding	1.00 0.60
Lt: Ludden-----	85	Very limited Depth to saturated zone Flooding Too clayey Slow water movement	1.00 1.00 1.00 0.94	Very limited Depth to saturated zone Too clayey Slow water movement Flooding	1.00 1.00 0.94 0.40	Very limited Depth to saturated zone Flooding Too clayey Slow water movement	1.00 1.00 1.00 0.94
Lu: Ludden, ponded-----	90	Very limited Depth to saturated zone Flooding Ponding Too clayey Slow water movement	1.00 1.00 1.00 1.00 0.94	Very limited Ponding Depth to saturated zone Too clayey Slow water movement Flooding	1.00 1.00 1.00 0.94 0.40	Very limited Depth to saturated zone Flooding Ponding Too clayey Slow water movement	1.00 1.00 1.00 1.00 0.94
Lw: Ludden, wet-----	85	Very limited Depth to saturated zone Flooding Ponding Too clayey Slow water movement	1.00 1.00 1.00 1.00 0.94	Very limited Ponding Depth to saturated zone Too clayey Slow water movement Flooding	1.00 1.00 1.00 0.94 0.40	Very limited Depth to saturated zone Flooding Ponding Too clayey Slow water movement	1.00 1.00 1.00 1.00 0.94
M-W: Miscellaneous water-	100	Not rated		Not rated		Not rated	
MaC: Maddock-----	50	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Very limited Slope	1.00
Egeland-----	35	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Very limited Slope	1.00
MdA: Max-----	50	Not limited		Not limited		Not limited	
Arnegard-----	40	Not limited		Not limited		Not limited	

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MdB:							
Max-----	60	Not limited		Not limited		Somewhat limited Slope	0.88
Arnegard-----	30	Not limited		Not limited		Not limited	
MgB:							
Max-----	45	Not limited		Not limited		Somewhat limited Slope	0.88
Arnegard-----	30	Not limited		Not limited		Not limited	
Zahl-----	20	Not limited		Not limited		Somewhat limited Slope	0.88
MnB:							
Max-----	40	Not limited		Not limited		Somewhat limited Slope	0.88
Niobell-----	30	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39	Somewhat limited Slope Slow water movement	0.50 0.39
Noonan-----	20	Somewhat limited Slow water movement	0.45	Somewhat limited Slow water movement	0.45	Somewhat limited Slope Slow water movement	0.50 0.45
MxC:							
Max-----	45	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Very limited Slope	1.00
Zahl-----	30	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Very limited Slope	1.00
Arnegard-----	20	Not limited		Not limited		Somewhat limited Slope	0.50
My:							
Miranda-----	50	Very limited Sodium content Slow water movement	1.00 0.45	Very limited Sodium content Slow water movement	1.00 0.45	Very limited Sodium content Slow water movement	1.00 0.45
Heil-----	40	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00
Mz:							
Moritz-----	55	Very limited Flooding Depth to saturated zone	1.00 0.07	Somewhat limited Depth to saturated zone	0.03	Somewhat limited Depth to saturated zone	0.07

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Mz: (cont.)							
Lowe-----	35	Very limited Depth to saturated zone Flooding	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Flooding	1.00 0.60
Na:							
Nahon-----	45	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Slow water movement Sodium content	1.00 1.00
Aberdeen-----	30	Somewhat limited Slow water movement	0.94	Somewhat limited Slow water movement	0.94	Somewhat limited Slow water movement	0.94
Exline-----	20	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Slow water movement Sodium content	1.00 1.00
Nb:							
Nahon-----	45	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Slow water movement Sodium content	1.00 1.00
Aberdeen-----	30	Somewhat limited Slow water movement	0.94	Somewhat limited Slow water movement	0.94	Somewhat limited Slow water movement	0.94
Exline-----	20	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Slow water movement Sodium content	1.00 1.00
Nc:							
Niobell-----	60	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39
Noonan-----	30	Somewhat limited Slow water movement	0.45	Somewhat limited Slow water movement	0.45	Somewhat limited Slow water movement	0.45
Nd:							
Niobell-----	40	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39
Noonan-----	30	Somewhat limited Slow water movement	0.45	Somewhat limited Slow water movement	0.45	Somewhat limited Slow water movement	0.45

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Nd: (cont.)							
Heil-----	20	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Slow water movement	1.00	Slow water movement	1.00	Slow water movement	1.00
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
NeA:							
Niobell-----	40	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39
Noonan-----	30	Somewhat limited Slow water movement	0.45	Somewhat limited Slow water movement	0.45	Somewhat limited Slow water movement	0.45
Max-----	20	Not limited		Not limited		Somewhat limited Slope	0.12
Nm:							
Noonan-----	55	Somewhat limited Slow water movement	0.45	Somewhat limited Slow water movement	0.45	Somewhat limited Slow water movement	0.45
Miranda-----	35	Very limited Sodium content	1.00	Very limited Sodium content	1.00	Very limited Sodium content	1.00
		Slow water movement	0.45	Slow water movement	0.45	Slow water movement	0.45
Nr:							
Northville-----	60	Very limited Flooding	1.00	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39
		Slow water movement	0.39				
Farmsworth-----	30	Very limited Flooding	1.00	Very limited Sodium content	1.00	Very limited Sodium content	1.00
		Sodium content	1.00	Slow water	0.45	Slow water	0.45
		Slow water movement	0.45	movement		movement	
		Depth to saturated zone	0.07	Depth to saturated zone	0.03	Depth to saturated zone	0.07
Nv:							
Northville-----	40	Very limited Flooding	1.00	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39
		Slow water movement	0.39				
Farmsworth-----	30	Very limited Flooding	1.00	Very limited Sodium content	1.00	Very limited Sodium content	1.00
		Sodium content	1.00	Slow water	0.45	Slow water	0.45
		Slow water movement	0.45	movement		movement	
		Depth to saturated zone	0.07	Depth to saturated zone	0.03	Depth to saturated zone	0.07

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Nv: (cont.) Hoven-----	20	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00
Ov: Overshue-----	90	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
Pa: Parnell-----	90	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.94	Very limited Ponding Depth to saturated zone Slow water movement	1.00 1.00 0.94	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.94
Pc: Parshall-----	85	Not limited		Not limited		Not limited	
PeA: Peever-----	85	Somewhat limited Slow water movement	0.60	Somewhat limited Slow water movement	0.60	Somewhat limited Slow water movement	0.60
PgB: Peever-----	60	Somewhat limited Slow water movement	0.60	Somewhat limited Slow water movement	0.60	Somewhat limited Slow water movement Slope	0.60 0.12
Buse-----	30	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slope Slow water movement	0.50 0.15
PoA: Peever-----	60	Somewhat limited Slow water movement	0.60	Somewhat limited Slow water movement	0.60	Somewhat limited Slow water movement	0.60
Cavour-----	30	Very limited Sodium content Slow water movement	1.00 1.00	Very limited Sodium content Slow water movement	1.00 1.00	Very limited Sodium content Slow water movement	1.00 1.00
Pp: Pits, gravel and sand-----	90	Very limited Slope Gravel content	1.00 0.25	Very limited Slope Gravel content	1.00 0.25	Very limited Gravel content Slope	1.00 1.00

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Pr: Playmoor-----	85	Very limited Depth to saturated zone Flooding Salinity	1.00 1.00 1.00	Very limited Depth to saturated zone Salinity Flooding	1.00 1.00 0.40	Very limited Depth to saturated zone Flooding Salinity	1.00 1.00 1.00
Py: Playmoor, channeled-	50	Very limited Depth to saturated zone Flooding Salinity	1.00 1.00 1.00	Very limited Depth to saturated zone Salinity Flooding	1.00 1.00 0.40	Very limited Depth to saturated zone Flooding Salinity	1.00 1.00 1.00
Lamoure, channeled--	40	Very limited Depth to saturated zone Flooding	1.00 1.00	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 1.00
Ra: Ranslo-----	85	Very limited Sodium content Flooding Slow water movement Depth to saturated zone	1.00 1.00 0.94 0.39	Very limited Sodium content Slow water movement Depth to saturated zone	1.00 0.94 0.19	Very limited Sodium content Slow water movement Flooding Depth to saturated zone	1.00 0.94 0.60 0.39
Re: Ranslo-----	50	Very limited Sodium content Flooding Slow water movement Depth to saturated zone	1.00 1.00 0.94 0.39	Very limited Sodium content Slow water movement Depth to saturated zone	1.00 0.94 0.19	Very limited Sodium content Slow water movement Flooding Depth to saturated zone	1.00 0.94 0.60 0.39
Harriet-----	40	Very limited Depth to saturated zone Sodium content Flooding Slow water movement	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Sodium content Slow water movement	1.00 1.00	Very limited Depth to saturated zone Sodium content Slow water movement Flooding	1.00 1.00 1.00 0.60
RfA: Renshaw-----	55	Not limited		Not limited		Not limited	
Fordville-----	35	Not limited		Not limited		Not limited	
RfB: Renshaw-----	60	Not limited		Not limited		Somewhat limited Slope	0.50
Fordville-----	30	Not limited		Not limited		Somewhat limited Slope	0.50

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
So:							
Southam-----	90	Very limited Depth to saturated zone Ponding Slow water movement Salinity	1.00 1.00 0.94 0.13	Very limited Ponding Depth to saturated zone Slow water movement Salinity	1.00 1.00 0.94 0.13	Very limited Depth to saturated zone Ponding Slow water movement Salinity	1.00 1.00 0.94 0.13
St:							
Stickney-----	60	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39
Dudley-----	30	Very limited Sodium content Slow water movement	1.00 0.45	Very limited Sodium content Slow water movement	1.00 0.45	Very limited Sodium content Slow water movement	1.00 0.45
Su:							
Stickney-----	40	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39
Dudley-----	30	Very limited Sodium content Slow water movement	1.00 0.45	Very limited Sodium content Slow water movement	1.00 0.45	Very limited Sodium content Slow water movement	1.00 0.45
Hoven-----	20	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Slow water movement Sodium content Ponding	1.00 1.00 1.00 1.00
Sw:							
Straw, channeled----	85	Very limited Flooding	1.00	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
Sx:							
Straw-----	90	Very limited Flooding	1.00	Not limited		Not limited	
TbE:							
Talmo, stony-----	45	Very limited Slope Large stones content	1.00 0.53	Very limited Slope Large stones content	1.00 0.53	Very limited Slope Gravel content Large stones content	1.00 0.91 0.53
Ethan, stony-----	35	Very limited Slope Large stones content	1.00 0.53	Very limited Slope Large stones content	1.00 0.53	Very limited Slope Large stones content	1.00 0.53

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Te: Tetonka-----	90	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.94	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.94	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.94
Tk: Toko-----	90	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.15	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.15	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.15
Tm: Toko, wet-----	90	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.15	Very limited Ponding Depth to saturated zone Slow water movement	1.00 1.00 0.15	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.15
Tn: Tonka-----	90	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.94	Very limited Ponding Depth to saturated zone Slow water movement	1.00 1.00 0.94	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.94
To: Tonka-----	60	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.94	Very limited Ponding Depth to saturated zone Slow water movement	1.00 1.00 0.94	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.94
Rimlap-----	30	Very limited Ponding Depth to saturated zone Slow water movement	1.00 0.99 0.94	Very limited Ponding Slow water movement Depth to saturated zone	1.00 0.94 0.78	Very limited Ponding Depth to saturated zone Slow water movement	1.00 0.99 0.94
Us: Udorthents, silty---	90	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15
Va: Vallars-----	60	Very limited Depth to saturated zone Slow water movement	1.00 0.15	Very limited Depth to saturated zone Slow water movement	0.99 0.15	Very limited Depth to saturated zone Slow water movement	1.00 0.15

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Va: (cont.) Hamerly-----	30	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15
VgA: Vang-----	85	Not limited		Not limited		Not limited	
W: Water-----	100	Not rated		Not rated		Not rated	
WaA: Williams-----	50	Not limited		Not limited		Not limited	
Bowbells-----	40	Not limited		Not limited		Not limited	
WaB: Williams-----	60	Not limited		Not limited		Somewhat limited Slope	0.88
Bowbells-----	30	Not limited		Not limited		Not limited	
WbA: Williams-----	45	Not limited		Not limited		Not limited	
Bowbells-----	25	Not limited		Not limited		Not limited	
Tonka-----	20	Very limited Depth to saturated zone	1.00	Very limited Ponding Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Ponding	1.00	saturated zone	1.00	Ponding	1.00
		Slow water movement	0.94	Slow water movement	0.94	Slow water movement	0.94
WbB: Williams-----	50	Not limited		Not limited		Somewhat limited Slope	0.88
Bowbells-----	25	Not limited		Not limited		Not limited	
Tonka-----	20	Very limited Depth to saturated zone	1.00	Very limited Ponding Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Ponding	1.00	saturated zone	1.00	Ponding	1.00
		Slow water movement	0.94	Slow water movement	0.94	Slow water movement	0.94
WcA: Williams-----	55	Not limited		Not limited		Not limited	
Niobell-----	30	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39
WcB: Williams-----	60	Not limited		Not limited		Somewhat limited Slope	0.88

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WcB: (cont.) Niobell-----	30	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39	Somewhat limited Slope Slow water movement	0.50 0.39
WdA: Williams-----	45	Not limited		Not limited		Not limited	
Niobell-----	25	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39
Tonka-----	20	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.94	Very limited Ponding Depth to saturated zone Slow water movement	1.00 1.00 0.94	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.94
WhD: Williams-----	50	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Very limited Slope	1.00
Vida-----	40	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
WmB: Williams-----	50	Not limited		Not limited		Somewhat limited Slope	0.88
Zahl-----	25	Not limited		Not limited		Somewhat limited Slope	0.88
Bowbells-----	20	Not limited		Not limited		Not limited	
WmC: Williams-----	45	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Very limited Slope	1.00
Zahl-----	30	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Very limited Slope	1.00
Bowbells-----	20	Not limited		Not limited		Somewhat limited Slope	0.88
Wn: Winship-----	60	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15
Tonka-----	30	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.94	Very limited Ponding Depth to saturated zone Slow water movement	1.00 1.00 0.94	Very limited Depth to saturated zone Ponding Slow water movement	1.00 1.00 0.94

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Wo: Winship-----	60	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15
Tonka-----	30	Very limited Depth to saturated zone	1.00	Very limited Ponding Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Slow water movement	0.94	Slow water movement	0.94	Slow water movement	0.94
Ws: Woonsocket-----	50	Not limited		Not limited		Not limited	
Whitelake-----	35	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39
Wt: Worthing-----	90	Very limited Depth to saturated zone	1.00	Very limited Ponding Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Slow water movement	0.94	Slow water movement	0.94	Slow water movement	0.94
Ww: Worthing, ponded----	90	Very limited Depth to saturated zone	1.00	Very limited Ponding Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Slow water movement	0.94	Slow water movement	0.94	Slow water movement	0.94
ZaE: Zahill-----	85	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
ZbC: Zahl-----	50	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Very limited Slope	1.00
Max-----	40	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Very limited Slope	1.00
ZbD: Zahl-----	55	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Max-----	35	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
ZgD: Zell-----	55	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Great Bend-----	35	Somewhat limited Slow water movement	0.15	Somewhat limited Slow water movement	0.15	Very limited Slope	1.00
		Slope	0.01	Slope	0.01	Slow water movement	0.15

Paths, Trails, and Golf Fairways

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Aa:							
Aastad-----	85	Not limited		Not limited		Not limited	
Ab:							
Aastad-----	50	Not limited		Not limited		Not limited	
Hamerly-----	35	Not limited		Not limited		Not limited	
Ad:							
Aastad-----	60	Not limited		Not limited		Not limited	
Tonka-----	30	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
Ae:							
Aberdeen-----	55	Not limited		Not limited		Not limited	
Nahon-----	35	Not limited		Not limited		Very limited Sodium content	1.00
Ah:							
Aberdeen-----	55	Not limited		Not limited		Not limited	
Nahon-----	35	Not limited		Not limited		Very limited Sodium content	1.00
An:							
Aberdeen-----	45	Not limited		Not limited		Not limited	
Nahon-----	25	Not limited		Not limited		Very limited Sodium content	1.00
Heil-----	20	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Sodium content Ponding	1.00 1.00 1.00
Ao:							
Aberdeen-----	45	Not limited		Not limited		Not limited	
Nahon-----	25	Not limited		Not limited		Very limited Sodium content	1.00
Heil-----	20	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Sodium content Ponding	1.00 1.00 1.00

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
At: Aguents, loamy-----	90	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
BaC: Beadle-----	80	Not limited		Not limited		Somewhat limited Slope	0.01
BdA: Beadle-----	50	Not limited		Not limited		Not limited	
Dudley-----	35	Not limited		Not limited		Very limited Sodium content	1.00
BeA: Beadle-----	60	Not limited		Not limited		Not limited	
Stickney-----	30	Not limited		Not limited		Not limited	
BeB: Beadle-----	60	Not limited		Not limited		Not limited	
Stickney-----	30	Not limited		Not limited		Not limited	
BfA: Beadle, stony-----	60	Somewhat limited Large stones content	0.53	Somewhat limited Large stones content	0.53	Somewhat limited Large stones content	0.32
Stickney, stony-----	30	Somewhat limited Large stones content	0.53	Somewhat limited Large stones content	0.53	Not limited	
BfB: Beadle, stony-----	60	Somewhat limited Large stones content	0.53	Somewhat limited Large stones content	0.53	Not limited	
Stickney, stony-----	30	Somewhat limited Large stones content	0.53	Somewhat limited Large stones content	0.53	Not limited	
Bg: Bearden-----	85	Not limited		Not limited		Not limited	
Bk: Bearden-----	60	Not limited		Not limited		Not limited	
Tonka-----	30	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
Bo: Beotia-----	90	Not limited		Not limited		Not limited	

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Br:							
Beotia-----	50	Not limited		Not limited		Not limited	
Rondell-----	35	Not limited		Not limited		Not limited	
Bs:							
Beotia-----	60	Not limited		Not limited		Not limited	
Winship-----	30	Not limited		Not limited		Not limited	
Bt:							
Beotia-----	60	Not limited		Not limited		Not limited	
Winship-----	30	Not limited		Not limited		Not limited	
Bu:							
Bon-----	90	Not limited		Not limited		Not limited	
Bw:							
Bon, channeled-----	85	Somewhat limited Flooding	0.40	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
BxD:							
Buse-----	55	Not limited		Not limited		Very limited Slope	1.00
Barnes-----	35	Not limited		Not limited		Somewhat limited Slope	0.63
ByE:							
Buse, stony-----	50	Very limited Slope Large stones content	1.00 0.53	Somewhat limited Large stones content	0.53	Very limited Slope Large stones content	1.00 0.01
Barnes, stony-----	35	Somewhat limited Large stones content Slope	0.53 0.08	Somewhat limited Large stones content	0.53	Very limited Slope Large stones content	1.00 0.05
BzE:							
Buse-----	50	Very limited Slope	1.00	Somewhat limited Slope	0.08	Very limited Slope	1.00
Langhei-----	40	Very limited Slope	1.00	Somewhat limited Slope	0.08	Very limited Slope	1.00
Ca:							
Camtown-----	55	Not limited		Not limited		Very limited Sodium content	1.00
Turton-----	30	Not limited		Not limited		Very limited Sodium content	1.00
Cf:							
Cavour-----	55	Not limited		Not limited		Very limited Sodium content	1.00
Ferney-----	35	Not limited		Not limited		Very limited Sodium content	1.00

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Co:							
Colvin, saline-----	85	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone Salinity	1.00 1.00 1.00
Cr:							
Cresbard-----	60	Not limited		Not limited		Not limited	
Cavour-----	30	Not limited		Not limited		Very limited Sodium content	1.00
Cs:							
Cresbard-----	40	Not limited		Not limited		Not limited	
Cavour-----	30	Not limited		Not limited		Very limited Sodium content	1.00
Heil-----	20	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Sodium content Ponding	1.00 1.00 1.00
Ct:							
Crossplain-----	60	Somewhat limited Depth to saturated zone Flooding	0.99 0.40	Somewhat limited Depth to saturated zone Flooding	0.99 0.40	Very limited Flooding Depth to saturated zone	1.00 0.99
Tetonka-----	30	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
Da:							
Davis-----	55	Not limited		Not limited		Not limited	
Northville-----	35	Not limited		Not limited		Not limited	
Db:							
Davison-----	85	Not limited		Not limited		Not limited	
Dd:							
Davison-----	50	Not limited		Not limited		Not limited	
Tetonka-----	40	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
DeA:							
Delmont-----	55	Not limited		Not limited		Somewhat limited Droughty	0.01
Enet-----	35	Not limited		Not limited		Not limited	

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Dk: Dimo-----	85	Not limited		Not limited		Not limited	
Dm: Dimo-----	55	Not limited		Not limited		Somewhat limited Depth to saturated zone	0.03
Grat-----	30	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
DoA: Doland-----	50	Not limited		Not limited		Not limited	
Embden-----	30	Not limited		Not limited		Not limited	
Dq: Dovecreek-----	90	Not limited		Not limited		Not limited	
Dr: Dovray-----	90	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Too clayey	1.00 1.00 1.00
Du: Dudley-----	55	Not limited		Not limited		Very limited Sodium content	1.00
Jerauld-----	35	Not limited		Not limited		Very limited Sodium content	1.00
Dx: Durrstein-----	85	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Flooding Sodium content Depth to saturated zone Salinity	1.00 1.00 1.00 1.00
Ea: Eckman-----	85	Not limited		Not limited		Not limited	
EcA: Eckman-----	50	Not limited		Not limited		Not limited	
Gardena-----	40	Not limited		Not limited		Not limited	
EcB: Eckman-----	60	Not limited		Not limited		Not limited	
Gardena-----	30	Not limited		Not limited		Not limited	
EdB: Eckman-----	60	Not limited		Not limited		Not limited	
Zell-----	30	Not limited		Not limited		Not limited	

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
EeB: Edgeley-----	85	Not limited		Not limited		Somewhat limited Depth to bedrock	0.42
EeC: Edgeley-----	85	Not limited		Not limited		Somewhat limited Depth to bedrock Slope	0.42 0.01
EeD: Edgeley-----	85	Not limited		Not limited		Very limited Slope Depth to bedrock	1.00 0.42
EgA: Egeland-----	50	Not limited		Not limited		Not limited	
Embdn-----	40	Not limited		Not limited		Not limited	
EgB: Egeland-----	50	Not limited		Not limited		Not limited	
Embdn-----	35	Not limited		Not limited		Not limited	
Ek: Elsmere-----	85	Somewhat limited Too sandy	0.84	Somewhat limited Too sandy	0.84	Somewhat limited Depth to saturated zone Droughty	0.03 0.01
EmE: Ethan-----	50	Very limited Slope	1.00	Somewhat limited Slope	0.56	Very limited Slope	1.00
Betts-----	40	Very limited Slope	1.00	Somewhat limited Slope	0.56	Very limited Slope	1.00
EnD: Ethan-----	55	Not limited		Not limited		Very limited Slope	1.00
Hand-----	35	Not limited		Not limited		Somewhat limited Slope	0.63
Er: Exline-----	50	Not limited		Not limited		Very limited Sodium content	1.00
Aberdeen-----	25	Not limited		Not limited		Not limited	
Nahon-----	20	Not limited		Not limited		Very limited Sodium content	1.00
Et: Exline-----	50	Not limited		Not limited		Very limited Sodium content	1.00
Aberdeen-----	25	Not limited		Not limited		Not limited	

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Et: (cont.) Nahon-----	20	Not limited		Not limited		Very limited Sodium content	1.00
Ew: Exline-----	50	Not limited		Not limited		Very limited Sodium content	1.00
Heil-----	40	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Sodium content Ponding	1.00 1.00 1.00
Ex: Exline-----	50	Not limited		Not limited		Very limited Sodium content	1.00
Heil-----	40	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Sodium content Ponding	1.00 1.00 1.00
EyA: Exline-----	45	Not limited		Not limited		Very limited Sodium content	1.00
Putney-----	40	Not limited		Not limited		Not limited	
Fa: Farmsworth-----	50	Not limited		Not limited		Very limited Sodium content Depth to saturated zone	1.00 0.03
Durrstein-----	35	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Flooding Sodium content Depth to saturated zone Salinity	1.00 1.00 1.00 1.00
Fe: Ferney-----	50	Not limited		Not limited		Very limited Sodium content	1.00
Heil-----	40	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Sodium content Ponding	1.00 1.00 1.00
Ff: Forestburg-----	60	Somewhat limited Too sandy	0.79	Somewhat limited Too sandy	0.79	Not limited	

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ff: (cont.) Elsmere-----	30	Somewhat limited Too sandy	0.84	Somewhat limited Too sandy	0.84	Somewhat limited Depth to saturated zone Droughty	0.19 0.01
Fh: Forestburg-----	45	Somewhat limited Too sandy	0.79	Somewhat limited Too sandy	0.79	Not limited	
Elsmere-----	25	Somewhat limited Too sandy	0.84	Somewhat limited Too sandy	0.84	Somewhat limited Depth to saturated zone Droughty	0.19 0.01
Toko-----	20	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
FmA: Forman-----	50	Not limited		Not limited		Not limited	
Aastad-----	40	Not limited		Not limited		Not limited	
FmB: Forman-----	60	Not limited		Not limited		Not limited	
Aastad-----	30	Not limited		Not limited		Not limited	
FnC: Forman-----	55	Not limited		Not limited		Somewhat limited Slope	0.01
Buse-----	35	Not limited		Not limited		Somewhat limited Slope	0.01
FrB: Forman-----	50	Not limited		Not limited		Not limited	
Buse-----	25	Not limited		Not limited		Not limited	
Aastad-----	20	Not limited		Not limited		Not limited	
FrC: Forman-----	45	Not limited		Not limited		Somewhat limited Slope	0.01
Buse-----	30	Not limited		Not limited		Somewhat limited Slope	0.01
Aastad-----	20	Not limited		Not limited		Not limited	
FsA: Forman-----	55	Not limited		Not limited		Not limited	
Cresbard-----	30	Not limited		Not limited		Not limited	

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FsB:							
Forman-----	60	Not limited		Not limited		Not limited	
Cresbard-----	30	Not limited		Not limited		Not limited	
FtA:							
Forman-----	45	Not limited		Not limited		Not limited	
Cresbard-----	25	Not limited		Not limited		Not limited	
Tonka-----	20	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
Ga:							
Gardena-----	90	Not limited		Not limited		Not limited	
Gd:							
Gardena-----	55	Not limited		Not limited		Not limited	
Glyndon-----	35	Not limited		Not limited		Not limited	
Ge:							
Gardena-----	50	Not limited		Not limited		Not limited	
Turton-----	35	Not limited		Not limited		Very limited Sodium content	1.00
GgA:							
Great Bend-----	90	Not limited		Not limited		Not limited	
GnA:							
Great Bend-----	50	Not limited		Not limited		Not limited	
Beotia-----	40	Not limited		Not limited		Not limited	
GnB:							
Great Bend-----	60	Not limited		Not limited		Not limited	
Beotia-----	30	Not limited		Not limited		Not limited	
GoA:							
Great Bend-----	50	Not limited		Not limited		Not limited	
Beotia-----	40	Not limited		Not limited		Not limited	
GpA:							
Great Bend-----	50	Not limited		Not limited		Not limited	
Putney-----	35	Not limited		Not limited		Not limited	
GpB:							
Great Bend-----	50	Not limited		Not limited		Not limited	
Putney-----	35	Not limited		Not limited		Not limited	

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GtB:							
Great Bend-----	60	Not limited		Not limited		Not limited	
Zell-----	30	Not limited		Not limited		Not limited	
GtC:							
Great Bend-----	50	Not limited		Not limited		Somewhat limited Slope	0.01
Zell-----	40	Not limited		Not limited		Somewhat limited Slope	0.01
GzC:							
Great Bend-----	45	Not limited		Not limited		Not limited	
Zell-----	25	Not limited		Not limited		Somewhat limited Slope	0.01
Huffton-----	20	Not limited		Not limited		Somewhat limited Slope	0.01
HaA:							
Hamerly-----	85	Not limited		Not limited		Not limited	
Hb:							
Hamerly-----	50	Not limited		Not limited		Not limited	
Tonka-----	40	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
HcA:							
Hand-----	50	Not limited		Not limited		Not limited	
Bonilla-----	40	Not limited		Not limited		Not limited	
HcB:							
Hand-----	60	Not limited		Not limited		Not limited	
Bonilla-----	30	Not limited		Not limited		Not limited	
HdA:							
Hand-----	50	Not limited		Not limited		Not limited	
Carthage-----	40	Not limited		Not limited		Not limited	
He:							
Hand-----	45	Not limited		Not limited		Not limited	
Carthage-----	25	Not limited		Not limited		Not limited	
Overshue-----	20	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HfC:							
Hand-----	55	Not limited		Not limited		Somewhat limited Slope	0.01
Ethan-----	35	Not limited		Not limited		Somewhat limited Slope	0.01
HgB:							
Hand-----	50	Not limited		Not limited		Not limited	
Ethan-----	25	Not limited		Not limited		Not limited	
Bonilla-----	20	Not limited		Not limited		Not limited	
HgC:							
Hand-----	45	Not limited		Not limited		Somewhat limited Slope	0.01
Ethan-----	30	Not limited		Not limited		Somewhat limited Slope	0.01
Bonilla-----	20	Not limited		Not limited		Not limited	
HhB:							
Hand-----	50	Not limited		Not limited		Not limited	
Ethan-----	25	Not limited		Not limited		Not limited	
Carthage-----	20	Not limited		Not limited		Not limited	
HjB:							
Hand-----	45	Not limited		Not limited		Not limited	
Talmo-----	35	Not limited		Not limited		Somewhat limited Droughty	0.51
HjC:							
Hand-----	45	Not limited		Not limited		Somewhat limited Slope	0.01
Talmo-----	35	Not limited		Not limited		Somewhat limited Droughty Slope	0.51 0.01
Hk:							
Harmony-----	55	Not limited		Not limited		Not limited	
Aberdeen-----	35	Not limited		Not limited		Not limited	
Hm:							
Harmony-----	55	Not limited		Not limited		Not limited	
Aberdeen-----	35	Not limited		Not limited		Not limited	
Hn:							
Harmony-----	55	Not limited		Not limited		Not limited	
Beotia-----	35	Not limited		Not limited		Not limited	

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ho:							
Harmony-----	55	Not limited		Not limited		Not limited	
Beotia-----	35	Not limited		Not limited		Not limited	
Hp:							
Harriet-----	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Sodium content Depth to saturated zone Flooding	1.00 1.00 0.60
Hr:							
Heil-----	90	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Sodium content Ponding	1.00 1.00 1.00
HsA:							
Henkin-----	55	Not limited		Not limited		Not limited	
Blendon-----	35	Not limited		Not limited		Not limited	
HsB:							
Henkin-----	60	Not limited		Not limited		Not limited	
Blendon-----	30	Not limited		Not limited		Not limited	
HtB:							
Houdek-----	50	Not limited		Not limited		Not limited	
Ethan-----	25	Not limited		Not limited		Not limited	
Prosper-----	20	Not limited		Not limited		Not limited	
HtC:							
Houdek-----	45	Not limited		Not limited		Somewhat limited Slope	0.01
Ethan-----	30	Not limited		Not limited		Somewhat limited Slope	0.01
Prosper-----	20	Not limited		Not limited		Not limited	
HuA:							
Houdek-----	50	Not limited		Not limited		Not limited	
Prosper-----	40	Not limited		Not limited		Not limited	
HuB:							
Houdek-----	60	Not limited		Not limited		Not limited	
Prosper-----	30	Not limited		Not limited		Not limited	
HwA:							
Houdek-----	55	Not limited		Not limited		Not limited	
Stickney-----	35	Not limited		Not limited		Not limited	

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HxA:							
Houdek-----	45	Not limited		Not limited		Not limited	
Stickney-----	25	Not limited		Not limited		Not limited	
Tetonka-----	20	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
Hy:							
Hoven-----	90	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Sodium content Ponding	1.00 1.00 1.00
Ie:							
Ipage-----	45	Very limited Too sandy	1.00	Very limited Too sandy	1.00	Somewhat limited Droughty	0.64
Els-----	25	Very limited Too sandy	1.00	Very limited Too sandy	1.00	Somewhat limited Droughty Depth to saturated zone	0.43 0.03
Shue-----	20	Very limited Depth to saturated zone Ponding Too sandy	1.00 1.00 0.92	Very limited Depth to saturated zone Ponding Too sandy	1.00 1.00 0.92	Very limited Depth to saturated zone Ponding	1.00 1.00
Jh:							
Jerauld-----	50	Not limited		Not limited		Very limited Sodium content	1.00
Hoven-----	40	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Sodium content Ponding	1.00 1.00 1.00
KaA:							
Kranzburg-----	50	Not limited		Not limited		Not limited	
Brookings-----	40	Not limited		Not limited		Not limited	
KbB:							
Kranzburg-----	40	Not limited		Not limited		Not limited	
Brookings-----	30	Not limited		Not limited		Not limited	
Buse-----	25	Not limited		Not limited		Not limited	
KcA:							
Kranzburg-----	55	Not limited		Not limited		Not limited	
Cresbard-----	30	Not limited		Not limited		Not limited	

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KtA:							
Kranzburg-----	45	Not limited		Not limited		Not limited	
Cresbard-----	25	Not limited		Not limited		Not limited	
Tonka-----	20	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
KzB:							
Kranzburg-----	40	Not limited		Not limited		Not limited	
Zell-----	30	Not limited		Not limited		Not limited	
Aastad-----	20	Not limited		Not limited		Not limited	
La:							
La Prairie-----	85	Not limited		Not limited		Not limited	
Lc:							
La Prairie, channeled-----	50	Not limited		Not limited		Somewhat limited Flooding	0.60
Holmquist, channeled-----	40	Somewhat limited Depth to saturated zone Flooding	0.99 0.40	Somewhat limited Depth to saturated zone Flooding	0.99 0.40	Very limited Flooding Depth to saturated zone	1.00 0.99
Ld:							
LaDelle-----	90	Not limited		Not limited		Not limited	
Le:							
LaDelle, channeled--	85	Somewhat limited Flooding	0.40	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
Lk:							
Lamo-----	90	Not limited		Not limited		Somewhat limited Flooding Depth to saturated zone	0.60 0.19
Lm:							
Lamoure-----	85	Somewhat limited Depth to saturated zone Flooding	0.99 0.40	Somewhat limited Depth to saturated zone Flooding	0.99 0.40	Very limited Flooding Depth to saturated zone	1.00 0.99
Ln:							
Lawet-----	85	Somewhat limited Depth to saturated zone	0.44	Somewhat limited Depth to saturated zone	0.44	Somewhat limited Depth to saturated zone Flooding	0.75 0.60
Lo:							
Lawet, wet-----	90	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding Flooding	1.00 1.00 0.60

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Lp: Lawet-----	60	Somewhat limited Depth to saturated zone	0.44	Somewhat limited Depth to saturated zone	0.44	Somewhat limited Depth to saturated zone Flooding	0.75 0.60
Davison-----	30	Not limited		Not limited		Not limited	
LrA: Lehr-----	55	Not limited		Not limited		Somewhat limited Droughty	0.01
Bowdle-----	35	Not limited		Not limited		Not limited	
LrB: Lehr-----	60	Not limited		Not limited		Somewhat limited Droughty	0.01
Bowdle-----	30	Not limited		Not limited		Not limited	
Ls: Lowe-----	85	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Flooding	1.00 0.60
Lt: Ludden-----	85	Very limited Depth to saturated zone Too clayey Flooding	1.00 1.00 0.40	Very limited Depth to saturated zone Too clayey Flooding	1.00 1.00 0.40	Very limited Flooding Depth to saturated zone Too clayey	1.00 1.00 1.00
Lu: Ludden, ponded-----	90	Very limited Depth to saturated zone Ponding Too clayey Flooding	1.00 1.00 1.00 0.40	Very limited Depth to saturated zone Ponding Too clayey Flooding	1.00 1.00 1.00 0.40	Very limited Ponding Flooding Depth to saturated zone Too clayey	1.00 1.00 1.00 1.00
Lw: Ludden, wet-----	85	Very limited Depth to saturated zone Ponding Too clayey Flooding	1.00 1.00 1.00 0.40	Very limited Depth to saturated zone Ponding Too clayey Flooding	1.00 1.00 1.00 0.40	Very limited Ponding Flooding Depth to saturated zone Too clayey	1.00 1.00 1.00 1.00
M-W: Miscellaneous water-	100	Not rated		Not rated		Not rated	
MaC: Maddock-----	50	Not limited		Not limited		Somewhat limited Slope	0.01
Egeland-----	35	Not limited		Not limited		Somewhat limited Slope	0.01

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MdA:							
Max-----	50	Not limited		Not limited		Not limited	
Arnegard-----	40	Not limited		Not limited		Not limited	
MdB:							
Max-----	60	Not limited		Not limited		Not limited	
Arnegard-----	30	Not limited		Not limited		Not limited	
MgB:							
Max-----	45	Not limited		Not limited		Not limited	
Arnegard-----	30	Not limited		Not limited		Not limited	
Zahl-----	20	Not limited		Not limited		Not limited	
MnB:							
Max-----	40	Not limited		Not limited		Not limited	
Niobell-----	30	Not limited		Not limited		Not limited	
Noonan-----	20	Not limited		Not limited		Not limited	
MxC:							
Max-----	45	Not limited		Not limited		Somewhat limited Slope	0.01
Zahl-----	30	Not limited		Not limited		Somewhat limited Slope	0.01
Arnegard-----	20	Not limited		Not limited		Not limited	
My:							
Miranda-----	50	Not limited		Not limited		Very limited Sodium content	1.00
Heil-----	40	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Sodium content Ponding	1.00 1.00
Mz:							
Moritz-----	55	Not limited		Not limited		Somewhat limited Depth to saturated zone	0.03
Lowe-----	35	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Flooding	1.00 0.60
Na:							
Nahon-----	45	Not limited		Not limited		Very limited Sodium content	1.00
Aberdeen-----	30	Not limited		Not limited		Not limited	

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Na: (cont.)							
Exline-----	20	Not limited		Not limited		Very limited Sodium content	1.00
Nb:							
Nahon-----	45	Not limited		Not limited		Very limited Sodium content	1.00
Aberdeen-----	30	Not limited		Not limited		Not limited	
Exline-----	20	Not limited		Not limited		Very limited Sodium content	1.00
Nc:							
Niobell-----	60	Not limited		Not limited		Not limited	
Noonan-----	30	Not limited		Not limited		Not limited	
Nd:							
Niobell-----	40	Not limited		Not limited		Not limited	
Noonan-----	30	Not limited		Not limited		Not limited	
Heil-----	20	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Sodium content Ponding	1.00 1.00 1.00
NeA:							
Niobell-----	40	Not limited		Not limited		Not limited	
Noonan-----	30	Not limited		Not limited		Not limited	
Max-----	20	Not limited		Not limited		Not limited	
Nm:							
Noonan-----	55	Not limited		Not limited		Not limited	
Miranda-----	35	Not limited		Not limited		Very limited Sodium content	1.00
Nr:							
Northville-----	60	Not limited		Not limited		Not limited	
Farmsworth-----	30	Not limited		Not limited		Very limited Sodium content Depth to saturated zone	1.00 0.03
Nv:							
Northville-----	40	Not limited		Not limited		Not limited	
Farmsworth-----	30	Not limited		Not limited		Very limited Sodium content Depth to saturated zone	1.00 0.03

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Nv: (cont.)							
Hoven-----	20	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Sodium content Ponding	1.00 1.00 1.00
Ov:							
Overshue-----	90	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
Pa:							
Parnell-----	90	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
Pc:							
Parshall-----	85	Not limited		Not limited		Not limited	
PeA:							
Peever-----	85	Not limited		Not limited		Not limited	
PgB:							
Peever-----	60	Not limited		Not limited		Not limited	
Buse-----	30	Not limited		Not limited		Not limited	
PoA:							
Peever-----	60	Not limited		Not limited		Not limited	
Cavour-----	30	Not limited		Not limited		Very limited Sodium content	1.00
Pp:							
Pits, gravel and sand-----	90	Very limited Slope	1.00	Somewhat limited Slope	0.22	Very limited Slope Droughty Gravel content	1.00 0.42 0.25
Pr:							
Playmoor-----	85	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Flooding Depth to saturated zone Salinity	1.00 1.00 1.00
Py:							
Playmoor, channeled-	50	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Flooding Depth to saturated zone Salinity	1.00 1.00 1.00

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Py: (cont.) Lamoure, channeled--	40	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Flooding Depth to saturated zone	1.00 1.00
Ra: Ranslo-----	85	Not limited		Not limited		Very limited Sodium content Flooding Depth to saturated zone	1.00 0.60 0.19
Re: Ranslo-----	50	Not limited		Not limited		Very limited Sodium content Flooding Depth to saturated zone	1.00 0.60 0.19
Harriet-----	40	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Sodium content Depth to saturated zone Flooding	1.00 1.00 0.60
RfA: Renshaw-----	55	Not limited		Not limited		Somewhat limited Droughty	0.03
Fordville-----	35	Not limited		Not limited		Not limited	
RfB: Renshaw-----	60	Not limited		Not limited		Somewhat limited Droughty	0.03
Fordville-----	30	Not limited		Not limited		Not limited	
So: Southam-----	90	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone Salinity	1.00 1.00 0.13
St: Stickney-----	60	Not limited		Not limited		Not limited	
Dudley-----	30	Not limited		Not limited		Very limited Sodium content	1.00
Su: Stickney-----	40	Not limited		Not limited		Not limited	
Dudley-----	30	Not limited		Not limited		Very limited Sodium content	1.00

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Su: (cont.) Hoven-----	20	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Sodium content Ponding	1.00 1.00 1.00
Sw: Straw, channeled----	85	Somewhat limited Flooding	0.40	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
Sx: Straw-----	90	Not limited		Not limited		Not limited	
TbE: Talmo, stony-----	45	Very limited Slope Large stones content	1.00 1.53	Somewhat limited Large stones content	0.53	Very limited Slope Droughty	1.00 0.51
Ethan, stony-----	35	Very limited Slope Large stones content	1.00 1.53	Somewhat limited Large stones content	0.53	Very limited Slope	1.00
Te: Tetonka-----	90	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
Tk: Toko-----	90	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
Tm: Toko, wet-----	90	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
Tn: Tonka-----	90	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
To: Tonka-----	60	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
Rimlap-----	30	Very limited Ponding Depth to saturated zone	1.00 0.50	Very limited Ponding Depth to saturated zone	1.00 0.50	Very limited Ponding Depth to saturated zone	1.00 0.78

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Us: Udorthents, silty---	90	Not limited		Not limited		Not limited	
Va: Vallers-----	60	Somewhat limited Depth to saturated zone	0.99	Somewhat limited Depth to saturated zone	0.99	Somewhat limited Depth to saturated zone	0.99
Hamerly-----	30	Not limited		Not limited		Not limited	
VgA: Vang-----	85	Not limited		Not limited		Not limited	
W: Water-----	100	Not rated		Not rated		Not rated	
WaA: Williams-----	50	Not limited		Not limited		Not limited	
Bowbells-----	40	Not limited		Not limited		Not limited	
WaB: Williams-----	60	Not limited		Not limited		Not limited	
Bowbells-----	30	Not limited		Not limited		Not limited	
WbA: Williams-----	45	Not limited		Not limited		Not limited	
Bowbells-----	25	Not limited		Not limited		Not limited	
Tonka-----	20	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
WbB: Williams-----	50	Not limited		Not limited		Not limited	
Bowbells-----	25	Not limited		Not limited		Not limited	
Tonka-----	20	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
WcA: Williams-----	55	Not limited		Not limited		Not limited	
Niobell-----	30	Not limited		Not limited		Not limited	
WcB: Williams-----	60	Not limited		Not limited		Not limited	
Niobell-----	30	Not limited		Not limited		Not limited	
WdA: Williams-----	45	Not limited		Not limited		Not limited	
Niobell-----	25	Not limited		Not limited		Not limited	

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WdA: (cont.)							
Tonka-----	20	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
WhD:							
Williams-----	50	Not limited		Not limited		Somewhat limited Slope	0.01
Vida-----	40	Not limited		Not limited		Somewhat limited Slope Large stones content	0.63 0.01
WmB:							
Williams-----	50	Not limited		Not limited		Not limited	
Zahl-----	25	Not limited		Not limited		Not limited	
Bowbells-----	20	Not limited		Not limited		Not limited	
WmC:							
Williams-----	45	Not limited		Not limited		Somewhat limited Slope	0.01
Zahl-----	30	Not limited		Not limited		Somewhat limited Slope	0.01
Bowbells-----	20	Not limited		Not limited		Not limited	
Wn:							
Winship-----	60	Not limited		Not limited		Not limited	
Tonka-----	30	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
Wo:							
Winship-----	60	Not limited		Not limited		Not limited	
Tonka-----	30	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
Ws:							
Woonsocket-----	50	Not limited		Not limited		Not limited	
Whitelake-----	35	Not limited		Not limited		Not limited	
Wt:							
Worthing-----	90	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ww: Worthing, ponded----	90	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
ZaE: Zahill-----	85	Very limited Slope	1.00	Somewhat limited Slope	0.08	Very limited Slope Large stones content	1.00 0.01
ZbC: Zahl-----	50	Not limited		Not limited		Somewhat limited Slope	0.01
Max-----	40	Not limited		Not limited		Somewhat limited Slope	0.01
ZbD: Zahl-----	55	Somewhat limited Slope	0.18	Not limited		Very limited Slope	1.00
Max-----	35	Not limited		Not limited		Somewhat limited Slope	0.63
ZgD: Zell-----	55	Somewhat limited Slope	0.08	Not limited		Very limited Slope	1.00
Great Bend-----	35	Not limited		Not limited		Somewhat limited Slope	0.01

Wildlife Habitat

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Potential for habitat elements								
	Grain and seed crops	Grasses and legumes	Native herba- ceous plants	Native decid- uous trees	Planted woody plants	Native conif- erous plants	Native shrubs	Wetland plants	Shallow water areas
Aa:									
Aastad-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
Ab:									
Aastad-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
Hamerly-----	Good	Good	Fair	Fair	Good	Poor	Fair	Poor	Poor
Ad:									
Aastad-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
Tonka-----	Poor	Poor	Fair	Very poor	Very poor	Very poor	Poor	Fair	Fair
Ae:									
Aberdeen-----	Fair	Fair	Good	Poor	Fair	Very poor	Poor	Very poor	Very poor
Nahon-----	Poor	Poor	Poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor
Ah:									
Aberdeen-----	Fair	Fair	Good	Poor	Fair	Very poor	Poor	Very poor	Very poor
Nahon-----	Poor	Poor	Poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor
An:									
Aberdeen-----	Fair	Fair	Good	Poor	Fair	Very poor	Poor	Very poor	Very poor
Nahon-----	Poor	Poor	Poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor
Heil-----	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Fair	Fair
Ao:									
Aberdeen-----	Fair	Fair	Good	Poor	Fair	Very poor	Poor	Very poor	Very poor
Nahon-----	Poor	Poor	Poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor
Heil-----	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Fair	Fair
At:									
Aguents, loamy-----	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Good	Good
BaC:									
Beadle-----	Poor	Fair	Good	Poor	Fair	Very poor	Poor	Very poor	Very poor

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								
	Grain and seed crops	Grasses and legumes	Native herba- ceous plants	Native decid- uous trees	Planted woody plants	Native conif- erous plants	Native shrubs	Wetland plants	Shallow water areas
BdA:									
Beadle-----	Good	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Dudley-----	Poor	Poor	Poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor
BeA:									
Beadle-----	Good	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Stickney-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
BeB:									
Beadle-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Stickney-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
BfA:									
Beadle, stony-----	Very poor	Very poor	Good	Poor	Very poor	Very poor	Poor	Very poor	Very poor
Stickney, stony-----	Very poor	Very poor	Good	Poor	Very poor	Very poor	Poor	Very poor	Very poor
BfB:									
Beadle, stony-----	Very poor	Very poor	Good	Poor	Very poor	Very poor	Poor	Very poor	Very poor
Stickney, stony-----	Very poor	Very poor	Good	Poor	Very poor	Very poor	Poor	Very poor	Very poor
Bg:									
Bearden-----	Good	Good	Fair	Fair	Good	Poor	Fair	Poor	Poor
Bk:									
Bearden-----	Good	Good	Fair	Fair	Good	Poor	Fair	Poor	Poor
Tonka-----	Poor	Poor	Fair	Very poor	Very poor	Very poor	Very poor	Fair	Fair
Bo:									
Beotia-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
Br:									
Beotia-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
Rondell-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Bs:									
Beotia-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
Winship-----	Good	Good	Good	Fair	Good	Poor	Fair	Poor	Poor

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								
	Grain and seed crops	Grasses and legumes	Native herba- ceous plants	Native decid- uous trees	Planted woody plants	Native conif- erous plants	Native shrubs	Wetland plants	Shallow water areas
Bt:									
Beotia-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
Winship-----	Good	Good	Good	Fair	Good	Poor	Fair	Poor	Poor
Bu:									
Bon-----	Good	Good	Good	Good	Good	Poor	Good	Very poor	Very poor
Bw:									
Bon, channeled-----	Very poor	Very poor	Good	Poor	Good	Very poor	Poor	Poor	Poor
BxD:									
Buse-----	Poor	Fair	Fair	Very poor	Poor	Very poor	Poor	Very poor	Very poor
Barnes-----	Poor	Good	Good	Very poor	Poor	Very poor	Poor	Very poor	Very poor
ByE:									
Buse, stony-----	Very poor	Very poor	Fair	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
Barnes, stony-----	Very poor	Very poor	Good	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
BzE:									
Buse-----	Very poor	Very poor	Fair	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
Langhei-----	Very poor	Very poor	Fair	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
Ca:									
Camtown-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Turton-----	Poor	Poor	Poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor
Cf:									
Cavour-----	Poor	Poor	Poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor
Ferney-----	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Very poor	Poor
Co:									
Colvin, saline-----	Poor	Poor	Fair	Poor	Very poor	Very poor	Poor	Fair	Fair
Cr:									
Cresbard-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Cavour-----	Poor	Poor	Poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								
	Grain and seed crops	Grasses and legumes	Native herba- ceous plants	Native decid- uous trees	Planted woody plants	Native conif- erous plants	Native shrubs	Wetland plants	Shallow water areas
Cs:									
Cresbard-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Cavour-----	Poor	Poor	Poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor
Heil-----	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Fair	Fair
Ct:									
Crossplain-----	Good	Good	Good	Fair	Good	Poor	Fair	Poor	Poor
Tetonka-----	Poor	Poor	Fair	Very poor	Very poor	Very poor	Poor	Fair	Fair
Da:									
Davis-----	Good	Good	Good	Good	Good	Poor	Good	Very poor	Very poor
Northville-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Db:									
Davison-----	Good	Good	Fair	Fair	Good	Poor	Fair	Poor	Poor
Dd:									
Davison-----	Good	Good	Fair	Fair	Good	Poor	Fair	Poor	Poor
Tetonka-----	Poor	Poor	Fair	Very poor	Very poor	Very poor	Poor	Fair	Fair
DeA:									
Delmont-----	Poor	Fair	Poor	Poor	Poor	Very poor	Poor	Very poor	Very poor
Enet-----	Fair	Fair	Good	Poor	Poor	Very poor	Poor	Very poor	Very poor
Dk:									
Dimo-----	Fair	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
Dm:									
Dimo-----	Good	Good	Good	Good	Good	Poor	Fair	Poor	Poor
Grat-----	Poor	Poor	Fair	Very poor	Very poor	Very poor	Poor	Fair	Fair
DoA:									
Doland-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Embden-----	Fair	Fair	Good	Fair	Fair	Poor	Fair	Very poor	Very poor
Dq:									
Dovecreek-----	Good	Good	Good	Good	Good	Poor	Good	Very poor	Very poor

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								
	Grain and seed crops	Grasses and legumes	Native herba- ceous plants	Native decid- uous trees	Planted woody plants	Native conif- erous plants	Native shrubs	Wetland plants	Shallow water areas
Dr: Dovray-----	Very poor	Poor	Poor	Very poor	Very poor	Very poor	Very poor	Good	Good
Du: Dudley-----	Poor	Poor	Poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor
Jerauld-----	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
Dx: Durrstein-----	Very poor	Poor	Fair	Very poor	Very poor	Very poor	Very poor	Fair	Fair
Ea: Eckman-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
EcA: Eckman-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Gardena-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
EcB: Eckman-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Gardena-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
EdB: Eckman-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Zell-----	Fair	Fair	Fair	Very poor	Poor	Very poor	Poor	Very poor	Very poor
EeB: Edgeley-----	Good	Good	Good	Poor	Fair	Very poor	Poor	Very poor	Very poor
EeC: Edgeley-----	Fair	Good	Good	Poor	Fair	Very poor	Poor	Very poor	Very poor
EeD: Edgeley-----	Poor	Good	Good	Poor	Poor	Very poor	Poor	Very poor	Very poor
EgA: Egeland-----	Fair	Fair	Good	Poor	Fair	Very poor	Poor	Very poor	Very poor
Embden-----	Fair	Fair	Good	Fair	Fair	Poor	Fair	Very poor	Very poor

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								
	Grain and seed crops	Grasses and legumes	Native herba- ceous plants	Native decid- uous trees	Planted woody plants	Native conif- erous plants	Native shrubs	Wetland plants	Shallow water areas
EgB: Egeland-----	Fair	Fair	Good	Poor	Fair	Very poor	Poor	Very poor	Very poor
Embden-----	Fair	Fair	Good	Fair	Fair	Poor	Fair	Very poor	Very poor
Ek: Elsmere-----	Poor	Good	Fair	Good	Good	Poor	Good	Poor	Poor
EmE: Ethan-----	Very poor	Very poor	Fair	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
Betts-----	Very poor	Very poor	Fair	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
EnD: Ethan-----	Very poor	Fair	Fair	Very poor	Poor	Very poor	Poor	Very poor	Very poor
Hand-----	Poor	Good	Good	Very poor	Poor	Very poor	Poor	Very poor	Very poor
Er: Exline-----	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
Aberdeen-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Nahon-----	Poor	Poor	Poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor
Et: Exline-----	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
Aberdeen-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Nahon-----	Poor	Poor	Poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor
Ew: Exline-----	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Poor	Poor
Heil-----	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Fair	Fair
Ex: Exline-----	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Poor	Poor
Heil-----	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Fair	Fair

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								
	Grain and seed crops	Grasses and legumes	Native herba- ceous plants	Native decid- uous trees	Planted woody plants	Native conif- erous plants	Native shrubs	Wetland plants	Shallow water areas
EyA:									
Exline-----	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
Putney-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Fa:									
Farmsworth-----	Poor	Poor	Poor	Poor	Poor	Very poor	Poor	Poor	Poor
Durrstein-----	Very poor	Poor	Fair	Very poor	Very poor	Very poor	Very poor	Fair	Fair
Fe:									
Ferney-----	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Poor	Poor
Heil-----	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Fair	Fair
Ff:									
Forestburg-----	Poor	Fair	Good	Fair	Fair	Poor	Fair	Very poor	Very poor
Elsmere-----	Poor	Good	Fair	Fair	Good	Poor	Fair	Poor	Poor
Fh:									
Forestburg-----	Poor	Fair	Good	Fair	Fair	Poor	Fair	Very poor	Very poor
Elsmere-----	Poor	Good	Fair	Fair	Good	Poor	Fair	Poor	Poor
Toko-----	Poor	Poor	Fair	Very poor	Very poor	Very poor	Poor	Fair	Fair
FmA:									
Forman-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Aastad-----	Good	Good	Good	Fair	Good	Very poor	Fair	Very poor	Very poor
FmB:									
Forman-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Aastad-----	Good	Good	Good	Fair	Good	Very poor	Fair	Very poor	Very poor
FnC:									
Forman-----	Fair	Good	Good	Poor	Fair	Very poor	Poor	Very poor	Very poor
Buse-----	Poor	Fair	Fair	Very poor	Poor	Very poor	Poor	Very poor	Very poor

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								
	Grain and seed crops	Grasses and legumes	Native herba- ceous plants	Native decid- uous trees	Planted woody plants	Native conif- erous plants	Native shrubs	Wetland plants	Shallow water areas
FrB:									
Forman-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Buse-----	Fair	Fair	Fair	Very poor	Poor	Very poor	Poor	Very poor	Very poor
Aastad-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
FrC:									
Forman-----	Fair	Good	Good	Poor	Fair	Very poor	Poor	Very poor	Very poor
Buse-----	Poor	Fair	Fair	Very poor	Poor	Very poor	Poor	Very poor	Very poor
Aastad-----	Good	Good	Good	Fair	Good	Very poor	Fair	Very poor	Very poor
FsA:									
Forman-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Cresbard-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
FsB:									
Forman-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Cresbard-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
FtA:									
Forman-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Cresbard-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Tonka-----	Poor	Poor	Fair	Very poor	Very poor	Very poor	Poor	Fair	Fair
Ga:									
Gardena-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
Gd:									
Gardena-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
Glyndon-----	Good	Good	Fair	Fair	Good	Poor	Fair	Poor	Poor
Ge:									
Gardena-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
Turton-----	Poor	Poor	Poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								
	Grain and seed crops	Grasses and legumes	Native herba- ceous plants	Native decid- uous trees	Planted woody plants	Native conif- erous plants	Native shrubs	Wetland plants	Shallow water areas
GgA: Great Bend-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
GnA: Great Bend-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Beotia-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
GnB: Great Bend-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Beotia-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
GoA: Great Bend-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Beotia-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
GpA: Great Bend-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Putney-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
GpB: Great Bend-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Putney-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
GtB: Great Bend-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Zell-----	Fair	Fair	Fair	Very poor	Poor	Very poor	Poor	Very poor	Very poor
GtC: Great Bend-----	Fair	Good	Good	Poor	Fair	Very poor	Poor	Very poor	Very poor
Zell-----	Poor	Fair	Fair	Very poor	Poor	Very poor	Poor	Very poor	Very poor
GzC: Great Bend-----	Fair	Good	Good	Poor	Fair	Very poor	Fair	Very poor	Very poor
Zell-----	Poor	Fair	Fair	Very poor	Poor	Very poor	Poor	Very poor	Very poor

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								
	Grain and seed crops	Grasses and legumes	Native herba- ceous plants	Native decid- uous trees	Planted woody plants	Native conif- erous plants	Native shrubs	Wetland plants	Shallow water areas
GzC: (cont.)									
Huffton-----	Poor	Fair	Fair	Very poor	Poor	Very poor	Very poor	Very poor	Very poor
HaA:									
Hamerly-----	Good	Good	Fair	Fair	Good	Poor	Fair	Poor	Poor
Hb:									
Hamerly-----	Good	Good	Fair	Fair	Good	Poor	Fair	Poor	Poor
Tonka-----	Poor	Poor	Fair	Very poor	Very poor	Very poor	Poor	Fair	Fair
HcA:									
Hand-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Bonilla-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
HcB:									
Hand-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Bonilla-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
HdA:									
Hand-----	Fair	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Carthage-----	Fair	Fair	Good	Fair	Fair	Poor	Fair	Very poor	Very poor
He:									
Hand-----	Fair	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Carthage-----	Fair	Fair	Good	Fair	Fair	Poor	Fair	Very poor	Very poor
Overshue-----	Poor	Poor	Fair	Poor	Good	Very poor	Poor	Fair	Fair
HfC:									
Hand-----	Fair	Good	Good	Poor	Fair	Very poor	Poor	Very poor	Very poor
Ethan-----	Poor	Fair	Fair	Very poor	Poor	Very poor	Poor	Very poor	Very poor
HgB:									
Hand-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Ethan-----	Fair	Fair	Fair	Very poor	Poor	Very poor	Poor	Very poor	Very poor
Bonilla-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								
	Grain and seed crops	Grasses and legumes	Native herba- ceous plants	Native decid- uous trees	Planted woody plants	Native conif- erous plants	Native shrubs	Wetland plants	Shallow water areas
HgC:									
Hand-----	Fair	Good	Good	Poor	Fair	Very poor	Poor	Very poor	Very poor
Ethan-----	Poor	Fair	Fair	Very poor	Poor	Very poor	Poor	Very poor	Very poor
Bonilla-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
HhB:									
Hand-----	Fair	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Ethan-----	Fair	Fair	Fair	Very poor	Poor	Very poor	Poor	Very poor	Very poor
Carthage-----	Fair	Fair	Good	Fair	Fair	Poor	Fair	Very poor	Very poor
HjB:									
Hand-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Talmo-----	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
HjC:									
Hand-----	Fair	Good	Good	Poor	Fair	Very poor	Poor	Very poor	Very poor
Talmo-----	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
Hk:									
Harmony-----	Good	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Aberdeen-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Hm:									
Harmony-----	Good	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Aberdeen-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Hn:									
Harmony-----	Good	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Beotia-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
Ho:									
Harmony-----	Good	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Beotia-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								
	Grain and seed crops	Grasses and legumes	Native herba- ceous plants	Native decid- uous trees	Planted woody plants	Native conif- erous plants	Native shrubs	Wetland plants	Shallow water areas
Hp: Harriet-----	Very poor	Poor	Fair	Very poor	Very poor	Very poor	Very poor	Fair	Fair
Hr: Heil-----	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Fair	Fair
HsA: Henkin-----	Fair	Fair	Good	Poor	Fair	Very poor	Poor	Very poor	Very poor
Blendon-----	Fair	Fair	Good	Fair	Fair	Poor	Fair	Very poor	Very poor
HsB: Henkin-----	Fair	Fair	Good	Poor	Fair	Very poor	Poor	Very poor	Very poor
Blendon-----	Fair	Fair	Good	Fair	Fair	Poor	Fair	Very poor	Very poor
HtB: Houdek-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Ethan-----	Fair	Fair	Fair	Very poor	Poor	Very poor	Poor	Very poor	Very poor
Prosper-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
HtC: Houdek-----	Fair	Good	Good	Poor	Fair	Very poor	Poor	Very poor	Very poor
Ethan-----	Poor	Fair	Fair	Very poor	Poor	Very poor	Poor	Very poor	Very poor
Prosper-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
HuA: Houdek-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Prosper-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
HuB: Houdek-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Prosper-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
HwA: Houdek-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								
	Grain and seed crops	Grasses and legumes	Native herba- ceous plants	Native decid- uous trees	Planted woody plants	Native conif- erous plants	Native shrubs	Wetland plants	Shallow water areas
HwA: (cont.) Stickney-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
HxA: Houdek-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Stickney-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Tetonka-----	Poor	Poor	Fair	Very poor	Very poor	Very poor	Poor	Fair	Fair
Hy: Hoven-----	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Fair	Fair
Ie: Ipage-----	Very poor	Fair	Good	Poor	Poor	Very poor	Poor	Very poor	Very poor
Els-----	Very poor	Good	Fair	Fair	Good	Poor	Fair	Poor	Poor
Shue-----	Poor	Poor	Fair	Poor	Good	Very poor	Poor	Fair	Fair
Jh: Jerauld-----	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Poor	Poor
Hoven-----	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Fair	Fair
KaA: Kranzburg-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Brookings-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
KbB: Kranzburg-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Brookings-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
Buse-----	Fair	Fair	Fair	Very poor	Poor	Very poor	Poor	Very poor	Very poor
KcA: Kranzburg-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Cresbard-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								
	Grain and seed crops	Grasses and legumes	Native herba- ceous plants	Native decid- uous trees	Planted woody plants	Native conif- erous plants	Native shrubs	Wetland plants	Shallow water areas
KtA:									
Kranzburg-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Cresbard-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Tonka-----	Poor	Poor	Fair	Very poor	Very poor	Very poor	Poor	Fair	Fair
KzB:									
Kranzburg-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Zell-----	Fair	Fair	Fair	Very poor	Poor	Very poor	Poor	Very poor	Very poor
Aastad-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
La:									
La Prairie-----	Good	Good	Good	Good	Good	Poor	Good	Very poor	Very poor
Lc:									
La Prairie, channeled-----	Very poor	Very poor	Good	Good	Good	Poor	Good	Poor	Poor
Holmquist, channeled-----	Very poor	Very poor	Fair	Very poor	Very poor	Very poor	Very poor	Fair	Fair
Ld:									
LaDelle-----	Good	Good	Good	Good	Good	Poor	Good	Very poor	Very poor
Le:									
LaDelle, channeled---	Very poor	Very poor	Good	Good	Good	Poor	Good	Poor	Poor
Lk:									
Lamo-----	Good	Good	Fair	Fair	Good	Poor	Fair	Fair	Fair
Lm:									
Lamoure-----	Fair	Good	Fair	Fair	Good	Poor	Fair	Fair	Fair
Ln:									
Lawet-----	Poor	Poor	Fair	Very poor	Good	Very poor	Poor	Fair	Fair
Lo:									
Lawet, wet-----	Very poor	Poor	Poor	Very poor	Very poor	Very poor	Very poor	Good	Good
Lp:									
Lawet-----	Poor	Poor	Fair	Very poor	Good	Very poor	Poor	Fair	Fair
Davison-----	Good	Good	Fair	Fair	Good	Poor	Fair	Poor	Poor

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								
	Grain and seed crops	Grasses and legumes	Native herba- ceous plants	Native decid- uous trees	Planted woody plants	Native conif- erous plants	Native shrubs	Wetland plants	Shallow water areas
LrA:									
Lehr-----	Poor	Fair	Fair	Poor	Poor	Very poor	Poor	Very poor	Very poor
Bowdle-----	Fair	Fair	Good	Poor	Poor	Very poor	Poor	Very poor	Very poor
LrB:									
Lehr-----	Poor	Fair	Fair	Poor	Poor	Very poor	Poor	Very poor	Very poor
Bowdle-----	Fair	Fair	Good	Poor	Poor	Very poor	Poor	Very poor	Very poor
Ls:									
Lowe-----	Poor	Good	Fair	Fair	Very poor	Poor	Fair	Fair	Fair
Lt:									
Ludden-----	Poor	Poor	Poor	Very poor	Very poor	Very poor	Poor	Fair	Fair
Lu:									
Ludden, ponded-----	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Good	Good
Lw:									
Ludden, wet-----	Very poor	Poor	Poor	Very poor	Very poor	Very poor	Very poor	Good	Good
M-W:									
Miscellaneous water---	---	---	---	---	---	---	---	---	---
MaC:									
Maddock-----	Poor	Fair	Good	Poor	Fair	Very poor	Poor	Very poor	Very poor
Egeland-----	Poor	Fair	Good	Poor	Fair	Very poor	Poor	Very poor	Very poor
MdA:									
Max-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Arnegard-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
MdB:									
Max-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Arnegard-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
MgB:									
Max-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Arnegard-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								
	Grain and seed crops	Grasses and legumes	Native herba- ceous plants	Native decid- uous trees	Planted woody plants	Native conif- erous plants	Native shrubs	Wetland plants	Shallow water areas
MgB: (cont.)									
Zahl-----	Fair	Fair	Fair	Very poor	Poor	Very poor	Poor	Poor	Very poor
MnB:									
Max-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Niobell-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Noonan-----	Poor	Poor	Poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor
MxC:									
Max-----	Fair	Good	Good	Poor	Fair	Very poor	Poor	Very poor	Very poor
Zahl-----	Poor	Fair	Fair	Very poor	Poor	Very poor	Poor	Very poor	Very poor
Arnegard-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
My:									
Miranda-----	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Poor	Poor
Heil-----	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Fair	Fair
Mz:									
Moritz-----	Good	Good	Fair	Fair	Good	Poor	Fair	Poor	Poor
Lowe-----	Poor	Good	Fair	Fair	Very poor	Poor	Fair	Fair	Fair
Na:									
Nahon-----	Poor	Poor	Poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor
Aberdeen-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Exline-----	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
Nb:									
Nahon-----	Poor	Poor	Poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor
Aberdeen-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Exline-----	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
Nc:									
Niobell-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								
	Grain and seed crops	Grasses and legumes	Native herba- ceous plants	Native decid- uous trees	Planted woody plants	Native conif- erous plants	Native shrubs	Wetland plants	Shallow water areas
Nc: (cont.)									
Noonan-----	Poor	Poor	Poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor
Nd:									
Niobell-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Noonan-----	Poor	Poor	Poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor
Heil-----	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Fair	Fair
NeA:									
Niobell-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Noonan-----	Poor	Poor	Poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor
Max-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Nm:									
Noonan-----	Poor	Poor	Poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor
Miranda-----	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Very poor	Poor
Nr:									
Northville-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Farmsworth-----	Poor	Poor	Poor	Poor	Poor	Very poor	Poor	Poor	Poor
Nv:									
Northville-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Farmsworth-----	Poor	Poor	Poor	Poor	Poor	Very poor	Poor	Poor	Poor
Hoven-----	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Fair	Fair
Ov:									
Overshue-----	Poor	Poor	Fair	Poor	Good	Very poor	Poor	Fair	Fair
Pa:									
Parnell-----	Very poor	Poor	Poor	Very poor	Very poor	Very poor	Very poor	Good	Good
Pc:									
Parshall-----	Good	Fair	Good	Poor	Fair	Very poor	Poor	Very poor	Very poor

Wildlife Habitat--Continued

[illegible]

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								
	Grain and seed crops	Grasses and legumes	Native herba- ceous plants	Native decid- uous trees	Planted woody plants	Native conif- erous plants	Native shrubs	Wetland plants	Shallow water areas
St: Stickney-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Dudley-----	Poor	Poor	Poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor
Su: Stickney-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Dudley-----	Poor	Poor	Poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor
Hoven-----	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Fair	Fair
Sw: Straw, channeled-----	Very poor	Very poor	Good	Poor	Good	Very poor	Poor	Poor	Poor
Sx: Straw-----	Good	Good	Good	Good	Good	Poor	Good	Very poor	Very poor
TbE: Talmo, stony-----	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
Ethan, stony-----	Very poor	Very poor	Fair	Very poor	Very poor	Very poor	Poor	Very poor	Very poor
Te: Tetonka-----	Poor	Poor	Fair	Very poor	Very poor	Very poor	Poor	Fair	Fair
Tk: Toko-----	Poor	Poor	Fair	Very poor	Very poor	Very poor	Poor	Fair	Fair
Tm: Toko, wet-----	Very poor	Poor	Poor	Very poor	Very poor	Very poor	Very poor	Good	Good
Tn: Tonka-----	Poor	Poor	Fair	Very poor	Very poor	Very poor	Poor	Fair	Fair
To: Tonka-----	Poor	Poor	Fair	Very poor	Very poor	Very poor	Poor	Fair	Fair
Rimlap-----	Poor	Poor	Fair	Very poor	Very poor	Very poor	Poor	Fair	Fair
Us: Udorthents, silty-----	Poor	Fair	Fair	Very poor	Poor	Very poor	Poor	Very poor	Very poor

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								
	Grain and seed crops	Grasses and legumes	Native herba- ceous plants	Native decid- uous trees	Planted woody plants	Native conif- erous plants	Native shrubs	Wetland plants	Shallow water areas
Va: Vallers-----	Poor	Good	Fair	Very poor	Poor	Very poor	Poor	Fair	Fair
Hamerly-----	Good	Good	Fair	Fair	Good	Poor	Fair	Poor	Poor
VgA: Vang-----	Fair	Fair	Good	Poor	Poor	Very poor	Poor	Very poor	Very poor
W: Water-----	---	---	---	---	---	---	---	---	---
WaA: Williams-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Bowbells-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
WaB: Williams-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Bowbells-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
WbA: Williams-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Bowbells-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
Tonka-----	Poor	Poor	Fair	Very poor	Very poor	Very poor	Poor	Fair	Fair
WbB: Williams-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Bowbells-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
Tonka-----	Poor	Poor	Fair	Very poor	Very poor	Very poor	Poor	Fair	Fair
WcA: Williams-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Niobell-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
WcB: Williams-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Niobell-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								
	Grain and seed crops	Grasses and legumes	Native herba- ceous plants	Native decid- uous trees	Planted woody plants	Native conif- erous plants	Native shrubs	Wetland plants	Shallow water areas
WdA:									
Williams-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Niobell-----	Fair	Fair	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Tonka-----	Poor	Poor	Fair	Very poor	Very poor	Very poor	Poor	Fair	Fair
WhD:									
Williams-----	Fair	Good	Good	Poor	Fair	Very poor	Poor	Very poor	Very poor
Vida-----	Poor	Good	Good	Poor	Poor	Very poor	Poor	Very poor	Very poor
WmB:									
Williams-----	Good	Good	Good	Poor	Good	Very poor	Poor	Very poor	Very poor
Zahl-----	Fair	Fair	Fair	Very poor	Poor	Very poor	Poor	Very poor	Very poor
Bowbells-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
WmC:									
Williams-----	Fair	Good	Good	Poor	Fair	Very poor	Poor	Very poor	Very poor
Zahl-----	Poor	Fair	Fair	Very poor	Poor	Very poor	Poor	Very poor	Very poor
Bowbells-----	Good	Good	Good	Fair	Good	Poor	Fair	Very poor	Very poor
Wn:									
Winship-----	Good	Good	Good	Fair	Good	Poor	Fair	Poor	Poor
Tonka-----	Poor	Poor	Fair	Very poor	Very poor	Very poor	Poor	Fair	Fair
Wo:									
Winship-----	Good	Good	Good	Fair	Good	Poor	Fair	Poor	Poor
Tonka-----	Poor	Poor	Fair	Very poor	Very poor	Very poor	Poor	Fair	Fair
Ws:									
Woonsocket-----	Fair	Fair	Good	Poor	Fair	Very poor	Poor	Very poor	Very poor
Whitelake-----	Poor	Fair	Poor	Very poor	Poor	Very poor	Very poor	Very poor	Very poor
Wt:									
Worthing-----	Very poor	Poor	Poor	Very poor	Very poor	Very poor	Very poor	Good	Good

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								
	Grain and seed crops	Grasses and legumes	Native herba- ceous plants	Native decid- uous trees	Planted woody plants	Native conif- erous plants	Native shrubs	Wetland plants	Shallow water areas
Ww: Worthing, ponded-----	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Good	Good
ZaE: Zahill-----	Very poor	Very poor	Fair	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
ZbC: Zahl-----	Poor	Fair	Fair	Very poor	Poor	Very poor	Poor	Very poor	Very poor
Max-----	Fair	Good	Good	Poor	Fair	Very poor	Fair	Very poor	Very poor
ZbD: Zahl-----	Very poor	Very poor	Fair	Very poor	Very poor	Very poor	Poor	Very poor	Very poor
Max-----	Poor	Good	Good	Poor	Poor	Very poor	Poor	Very poor	Very poor
ZgD: Zell-----	Very poor	Very poor	Fair	Very poor	Very poor	Very poor	Poor	Very poor	Very poor
Great Bend-----	Fair	Good	Good	Poor	Fair	Very poor	Poor	Very poor	Very poor

Dwellings and Small Commercial Buildings

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Aa: Aastad-----	85	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone Shrink-swell	0.61 0.50	Somewhat limited Shrink-swell	0.50
Ab: Aastad-----	50	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone Shrink-swell	0.61 0.50	Somewhat limited Shrink-swell	0.50
Hamerly-----	35	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone Shrink-swell	0.99 0.50	Somewhat limited Shrink-swell	0.50
Ad: Aastad-----	60	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone Shrink-swell	0.61 0.50	Somewhat limited Shrink-swell	0.50
Tonka-----	30	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00
Ae: Aberdeen-----	55	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00
Nahon-----	35	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.47	Very limited Shrink-swell	1.00
Ah: Aberdeen-----	55	Very limited Shrink-swell	1.00	Somewhat limited Depth to saturated zone	0.47	Very limited Shrink-swell	1.00
Nahon-----	35	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.47	Very limited Shrink-swell	1.00
An: Aberdeen-----	45	Very limited Shrink-swell	1.00	Somewhat limited Depth to saturated zone	0.47	Very limited Shrink-swell	1.00

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
An: (cont.)							
Nahon-----	25	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.47	Very limited Shrink-swell	1.00
Heil-----	20	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00
Ao:							
Aberdeen-----	45	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00
Nahon-----	25	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.47	Very limited Shrink-swell	1.00
Heil-----	20	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00
At:							
Aquents, loamy-----	90	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.50
BaC:							
Beadle-----	80	Very limited Shrink-swell Slope	1.00 0.01	Very limited Shrink-swell Slope	1.00 0.01	Very limited Shrink-swell Slope	1.00 1.00
BdA:							
Beadle-----	50	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.15	Very limited Shrink-swell	1.00
Dudley-----	35	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00
BeA:							
Beadle-----	60	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.15	Very limited Shrink-swell	1.00

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BeA: (cont.) Stickney-----	30	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Somewhat limited Shrink-swell	0.50
BeB: Beadle-----	60	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.15	Very limited Shrink-swell	1.00
Stickney-----	30	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Somewhat limited Shrink-swell	0.50
BfA: Beadle, stony-----	60	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.15	Very limited Shrink-swell	1.00
Stickney, stony-----	30	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Somewhat limited Shrink-swell	0.50
BfB: Beadle, stony-----	60	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.15	Very limited Shrink-swell	1.00
Stickney, stony-----	30	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Somewhat limited Shrink-swell	0.50
Bg: Bearden-----	85	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone Shrink-swell	0.99 0.50	Somewhat limited Shrink-swell	0.50
Bk: Bearden-----	60	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone Shrink-swell	0.99 0.50	Somewhat limited Shrink-swell	0.50
Tonka-----	30	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Bo: Beotia-----	90	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell	0.50
Br: Beotia-----	50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell	0.50
Rondell-----	35	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone	0.47	Somewhat limited Shrink-swell	0.50
Bs: Beotia-----	60	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Somewhat limited Shrink-swell	0.50
Winship-----	30	Not limited		Somewhat limited Depth to saturated zone Shrink-swell	0.99 0.50	Not limited	
Bt: Beotia-----	60	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Somewhat limited Shrink-swell	0.50
Winship-----	30	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone Shrink-swell	0.99 0.50	Somewhat limited Shrink-swell	0.50
Bu: Bon-----	90	Very limited Flooding	1.00	Very limited Flooding Depth to saturated zone	1.00 0.61	Very limited Flooding	1.00
Bw: Bon, channeled-----	85	Very limited Flooding	1.00	Very limited Flooding Depth to saturated zone	1.00 0.61	Very limited Flooding	1.00
BxD: Buse-----	55	Very limited Slope Shrink-swell	1.00 0.50	Very limited Slope Shrink-swell	1.00 0.50	Very limited Slope Shrink-swell	1.00 0.50
Barnes-----	35	Somewhat limited Slope Shrink-swell	0.63 0.50	Somewhat limited Slope Shrink-swell	0.63 0.50	Very limited Slope Shrink-swell	1.00 0.50

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ByE:							
Buse, stony-----	50	Very limited Slope Shrink-swell	1.00 0.50	Very limited Slope Shrink-swell	1.00 0.50	Very limited Slope Shrink-swell	1.00 0.50
Barnes, stony-----	35	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
BzE:							
Buse-----	50	Very limited Slope Shrink-swell	1.00 0.50	Very limited Slope Shrink-swell	1.00 0.50	Very limited Slope Shrink-swell	1.00 0.50
Langhei-----	40	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Ca:							
Camtown-----	55	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone	0.47	Somewhat limited Shrink-swell	0.50
Turton-----	30	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone	0.47	Somewhat limited Shrink-swell	0.50
Cf:							
Cavour-----	55	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00
Ferney-----	35	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.47	Very limited Shrink-swell	1.00
Co:							
Colvin, saline-----	85	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.50
Cr:							
Cresbard-----	60	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00
Cavour-----	30	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00
Cs:							
Cresbard-----	40	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Cs: (cont.)							
Cavour-----	30	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00
Heil-----	20	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00
Ct:							
Crossplain-----	60	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00
Tetonka-----	30	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00
Da:							
Davis-----	55	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Depth to saturated zone	1.00 0.61	Very limited Flooding Shrink-swell	1.00 0.50
Northville-----	35	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 0.61 0.50	Very limited Flooding Shrink-swell	1.00 0.50
Db:							
Davison-----	85	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone Shrink-swell	0.99 0.50	Somewhat limited Shrink-swell	0.50
Dd:							
Davison-----	50	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone Shrink-swell	0.99 0.50	Somewhat limited Shrink-swell	0.50
Tetonka-----	40	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00
DeA:							
Delmont-----	55	Not limited		Not limited		Not limited	
Enet-----	35	Not limited		Not limited		Not limited	

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Dk: Dimo-----	85	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Depth to saturated zone	1.00 0.61	Very limited Flooding Shrink-swell	1.00 0.50
Dm: Dimo-----	55	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 0.50 0.07	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 0.50 0.07
Grat-----	30	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00
DoA: Doland-----	50	Not limited		Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Not limited	
Embden-----	30	Not limited		Somewhat limited Depth to saturated zone	0.61	Not limited	
Dq: Dovecreek-----	90	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 0.50 0.47	Very limited Flooding Shrink-swell	1.00 0.50
Dr: Dovray-----	90	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00
Du: Dudley-----	55	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00
Jerauld-----	35	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.47	Very limited Shrink-swell	1.00

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Dx:							
Durrstein-----	85	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00
Ea:							
Eckman-----	85	Not limited		Not limited		Not limited	
EcA:							
Eckman-----	50	Not limited		Not limited		Not limited	
Gardena-----	40	Not limited		Somewhat limited Depth to saturated zone	0.61	Not limited	
EcB:							
Eckman-----	60	Not limited		Not limited		Not limited	
Gardena-----	30	Not limited		Somewhat limited Depth to saturated zone	0.61	Not limited	
EdB:							
Eckman-----	60	Not limited		Not limited		Not limited	
Zell-----	30	Not limited		Not limited		Not limited	
EeB:							
Edgeley-----	85	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to soft bedrock	0.50 0.42	Somewhat limited Shrink-swell	0.50
EeC:							
Edgeley-----	85	Somewhat limited Shrink-swell Slope	0.50 0.01	Somewhat limited Shrink-swell Depth to soft bedrock Slope	0.50 0.42 0.01	Very limited Slope Shrink-swell	1.00 0.50
EeD:							
Edgeley-----	85	Very limited Slope Shrink-swell	1.00 0.50	Very limited Slope Shrink-swell Depth to soft bedrock	1.00 0.50 0.42	Very limited Slope Shrink-swell	1.00 0.50
EgA:							
Egeland-----	50	Not limited		Not limited		Not limited	
Embden-----	40	Not limited		Somewhat limited Depth to saturated zone	0.61	Not limited	
EgB:							
Egeland-----	50	Not limited		Not limited		Not limited	

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
EgB: (cont.) Embden-----	35	Not limited		Somewhat limited Depth to saturated zone	0.61	Not limited	
Ek: Elsmere-----	85	Somewhat limited Depth to saturated zone	0.07	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.07
EmE: Ethan-----	50	Very limited Slope Shrink-swell	1.00 0.50	Very limited Slope Shrink-swell	1.00 0.50	Very limited Slope Shrink-swell	1.00 0.50
Betts-----	40	Very limited Slope Shrink-swell	1.00 0.50	Very limited Slope Shrink-swell	1.00 0.50	Very limited Slope Shrink-swell	1.00 0.50
EnD: Ethan-----	55	Very limited Slope Shrink-swell	1.00 0.50	Very limited Slope Shrink-swell	1.00 0.50	Very limited Slope Shrink-swell	1.00 0.50
Hand-----	35	Somewhat limited Slope Shrink-swell	0.63 0.50	Somewhat limited Slope Shrink-swell	0.63 0.50	Very limited Slope Shrink-swell	1.00 0.50
Er: Exline-----	50	Very limited Shrink-swell	1.00	Somewhat limited Depth to saturated zone Shrink-swell	0.99 0.50	Very limited Shrink-swell	1.00
Aberdeen-----	25	Very limited Shrink-swell	1.00	Somewhat limited Depth to saturated zone	0.47	Very limited Shrink-swell	1.00
Nahon-----	20	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.47	Very limited Shrink-swell	1.00
Et: Exline-----	50	Very limited Shrink-swell	1.00	Somewhat limited Depth to saturated zone Shrink-swell	0.99 0.50	Very limited Shrink-swell	1.00
Aberdeen-----	25	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00
Nahon-----	20	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.47	Very limited Shrink-swell	1.00

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ew:							
Exline-----	50	Very limited Shrink-swell	1.00	Somewhat limited Depth to saturated zone Shrink-swell	0.99 0.50	Very limited Shrink-swell	1.00
Heil-----	40	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00
Ex:							
Exline-----	50	Very limited Shrink-swell	1.00	Somewhat limited Depth to saturated zone Shrink-swell	0.99 0.50	Very limited Shrink-swell	1.00
Heil-----	40	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00
EyA:							
Exline-----	45	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00
Putney-----	40	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone	0.15	Somewhat limited Shrink-swell	0.50
Fa:							
Farmsworth-----	50	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 1.00 0.07	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 1.00 0.07
Durrstein-----	35	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00
Fe:							
Ferney-----	50	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.99	Very limited Shrink-swell	1.00
Heil-----	40	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ff:							
Forestburg-----	60	Not limited		Somewhat limited Depth to saturated zone	0.90	Not limited	
Elsmere-----	30	Somewhat limited Depth to saturated zone	0.39	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.39
Fh:							
Forestburg-----	45	Not limited		Somewhat limited Depth to saturated zone	0.90	Not limited	
Elsmere-----	25	Somewhat limited Depth to saturated zone	0.39	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.39
Toko-----	20	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Shrink-swell	0.50			Shrink-swell	0.50
FmA:							
Forman-----	50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell	0.50
Aastad-----	40	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone Shrink-swell	0.61 0.50	Somewhat limited Shrink-swell	0.50
FmB:							
Forman-----	60	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell Slope	0.50 0.12
Aastad-----	30	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone Shrink-swell	0.61 0.50	Somewhat limited Shrink-swell	0.50
FnC:							
Forman-----	55	Somewhat limited Shrink-swell Slope	0.50 0.01	Somewhat limited Shrink-swell Slope	0.50 0.01	Very limited Slope Shrink-swell	1.00 0.50
Buse-----	35	Somewhat limited Shrink-swell Slope	0.50 0.01	Somewhat limited Shrink-swell Slope	0.50 0.01	Very limited Slope Shrink-swell	1.00 0.50
FrB:							
Forman-----	50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell	0.50

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FrB: (cont.)							
Buse-----	25	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.12
Aastad-----	20	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone Shrink-swell	0.61 0.50	Somewhat limited Shrink-swell	0.50
FrC:							
Forman-----	45	Somewhat limited Shrink-swell Slope	0.50 0.01	Somewhat limited Shrink-swell Slope	0.50 0.01	Very limited Slope Shrink-swell	1.00 0.50
Buse-----	30	Somewhat limited Shrink-swell Slope	0.50 0.01	Somewhat limited Shrink-swell Slope	0.50 0.01	Very limited Slope Shrink-swell	1.00 0.50
Aastad-----	20	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone Shrink-swell	0.61 0.50	Somewhat limited Shrink-swell	0.50
FsA:							
Forman-----	55	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell	0.50
Cresbard-----	30	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00
FsB:							
Forman-----	60	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell	0.50
Cresbard-----	30	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00
FtA:							
Forman-----	45	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell	0.50
Cresbard-----	25	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FtA: (cont.) Tonka-----	20	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00
Ga: Gardena-----	90	Not limited		Somewhat limited Depth to saturated zone	0.61	Not limited	
Gd: Gardena-----	55	Not limited		Somewhat limited Depth to saturated zone	0.61	Not limited	
Glyndon-----	35	Not limited		Somewhat limited Depth to saturated zone	0.90	Not limited	
Ge: Gardena-----	50	Not limited		Somewhat limited Depth to saturated zone	0.61	Not limited	
Turton-----	35	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone	0.47	Somewhat limited Shrink-swell	0.50
GgA: Great Bend-----	90	Not limited		Somewhat limited Depth to saturated zone	0.15	Not limited	
GnA: Great Bend-----	50	Not limited		Somewhat limited Depth to saturated zone	0.15	Not limited	
Beotia-----	40	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell	0.50
GnB: Great Bend-----	60	Not limited		Somewhat limited Depth to saturated zone	0.15	Not limited	
Beotia-----	30	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell	0.50
GoA: Great Bend-----	50	Not limited		Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Not limited	

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GoA: (cont.) Beotia-----	40	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell	0.50
GpA: Great Bend-----	50	Not limited		Somewhat limited Depth to saturated zone	0.15	Not limited	
Putney-----	35	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone	0.15	Somewhat limited Shrink-swell	0.50
GpB: Great Bend-----	50	Not limited		Somewhat limited Depth to saturated zone	0.15	Not limited	
Putney-----	35	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone	0.15	Somewhat limited Shrink-swell	0.50
GtB: Great Bend-----	60	Not limited		Somewhat limited Depth to saturated zone	0.15	Not limited	
Zell-----	30	Not limited		Not limited		Not limited	
GtC: Great Bend-----	50	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Very limited Slope	1.00
Zell-----	40	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Very limited Slope	1.00
GzC: Great Bend-----	45	Not limited		Not limited		Somewhat limited Slope	0.88
Zell-----	25	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Very limited Slope	1.00
Huffton-----	20	Somewhat limited Shrink-swell Slope	0.50 0.01	Somewhat limited Slope	0.01	Very limited Slope Shrink-swell	1.00 0.50
HaA: Hamerly-----	85	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone Shrink-swell	0.99 0.50	Somewhat limited Shrink-swell	0.50
Hb: Hamerly-----	50	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone Shrink-swell	0.99 0.50	Somewhat limited Shrink-swell	0.50

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Hb: (cont.) Tonka-----	40	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00
HcA: Hand-----	50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell	0.50
Bonilla-----	40	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Somewhat limited Shrink-swell	0.50
HcB: Hand-----	60	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell	0.50
Bonilla-----	30	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Somewhat limited Shrink-swell	0.50
HdA: Hand-----	50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell	0.50
Carthage-----	40	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone Shrink-swell	0.82 0.50	Somewhat limited Shrink-swell	0.50
He: Hand-----	45	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell	0.50
Carthage-----	25	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone Shrink-swell	0.82 0.50	Somewhat limited Shrink-swell	0.50
Overshue-----	20	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
HfC: Hand-----	55	Somewhat limited Shrink-swell Slope	0.50 0.01	Somewhat limited Shrink-swell Slope	0.50 0.01	Very limited Slope Shrink-swell	1.00 0.50

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HfC: (cont.)							
Ethan-----	35	Somewhat limited Shrink-swell Slope	0.50 0.01	Somewhat limited Shrink-swell Slope	0.50 0.01	Very limited Slope Shrink-swell	1.00 0.50
HgB:							
Hand-----	50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell	0.50
Ethan-----	25	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
Bonilla-----	20	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Somewhat limited Shrink-swell	0.50
HgC:							
Hand-----	45	Somewhat limited Shrink-swell Slope	0.50 0.01	Somewhat limited Shrink-swell Slope	0.50 0.01	Very limited Slope Shrink-swell	1.00 0.50
Ethan-----	30	Somewhat limited Shrink-swell Slope	0.50 0.01	Somewhat limited Shrink-swell Slope	0.50 0.01	Very limited Slope Shrink-swell	1.00 0.50
Bonilla-----	20	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Somewhat limited Shrink-swell	0.50
HhB:							
Hand-----	50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell	0.50
Ethan-----	25	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
Carthage-----	20	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone Shrink-swell	0.82 0.50	Somewhat limited Shrink-swell	0.50
HjB:							
Hand-----	45	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell	0.50
Talmo-----	35	Not limited		Not limited		Not limited	
HjC:							
Hand-----	45	Somewhat limited Shrink-swell Slope	0.50 0.01	Somewhat limited Shrink-swell Slope	0.50 0.01	Very limited Slope Shrink-swell	1.00 0.50

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HjC: (cont.) Talmo-----	35	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Very limited Slope	1.00
Hk: Harmony-----	55	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.47	Very limited Shrink-swell	1.00
Aberdeen-----	35	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00
Hm: Harmony-----	55	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00
Aberdeen-----	35	Very limited Shrink-swell	1.00	Somewhat limited Depth to saturated zone	0.47	Very limited Shrink-swell	1.00
Hn: Harmony-----	55	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00
Beotia-----	35	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell	0.50
Ho: Harmony-----	55	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.47	Very limited Shrink-swell	1.00
Beotia-----	35	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell	0.50
Hp: Harriet-----	90	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50
Hr: Heil-----	90	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HsA:							
Henkin-----	55	Not limited		Not limited		Not limited	
Blendon-----	35	Not limited		Somewhat limited Depth to saturated zone	0.15	Not limited	
HsB:							
Henkin-----	60	Not limited		Not limited		Not limited	
Blendon-----	30	Not limited		Somewhat limited Depth to saturated zone	0.15	Not limited	
HtB:							
Houdek-----	50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell	0.50
Ethan-----	25	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
Prosper-----	20	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Somewhat limited Shrink-swell	0.50
HtC:							
Houdek-----	45	Somewhat limited Shrink-swell Slope	0.50 0.01	Somewhat limited Shrink-swell Slope	0.50 0.01	Very limited Slope Shrink-swell	1.00 0.50
Ethan-----	30	Somewhat limited Shrink-swell Slope	0.50 0.01	Somewhat limited Shrink-swell Slope	0.50 0.01	Very limited Slope Shrink-swell	1.00 0.50
Prosper-----	20	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Somewhat limited Shrink-swell	0.50
HuA:							
Houdek-----	50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell	0.50
Prosper-----	40	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Somewhat limited Shrink-swell	0.50
HuB:							
Houdek-----	60	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell	0.50

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HuB: (cont.) Prosper-----	30	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Somewhat limited Shrink-swell	0.50
HwA: Houdek-----	55	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell	0.50
Stickney-----	35	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Somewhat limited Shrink-swell	0.50
HxA: Houdek-----	45	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell	0.50
Stickney-----	25	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Somewhat limited Shrink-swell	0.50
Tetonka-----	20	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00
Hy: Hoven-----	90	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00
Ie: Ipage-----	45	Not limited		Somewhat limited Depth to saturated zone	0.47	Not limited	
Els-----	25	Somewhat limited Depth to saturated zone	0.07	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.07
Shue-----	20	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding Shrink-swell	1.00 1.00 0.50	Very limited Depth to saturated zone Ponding	1.00 1.00

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Jh:							
Jerauld-----	50	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.99	Very limited Shrink-swell	1.00
Hoven-----	40	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00
KaA:							
Kranzburg-----	50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell	0.50
Brookings-----	40	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone Shrink-swell	0.61 0.50	Somewhat limited Shrink-swell	0.50
KbB:							
Kranzburg-----	40	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell	0.50
Brookings-----	30	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone Shrink-swell	0.61 0.50	Somewhat limited Shrink-swell	0.50
Buse-----	25	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.12
KcA:							
Kranzburg-----	55	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell	0.50
Cresbard-----	30	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00
KtA:							
Kranzburg-----	45	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell	0.50
Cresbard-----	25	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KtA: (cont.) Tonka-----	20	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00
KzB: Kranzburg-----	40	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell	0.50
Zell-----	30	Not limited		Not limited		Not limited	
Aastad-----	20	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone Shrink-swell	0.61 0.50	Somewhat limited Shrink-swell	0.50
La: La Prairie-----	85	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 0.50 0.47	Very limited Flooding Shrink-swell	1.00 0.50
Lc: La Prairie, channeled-----	50	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 0.50 0.47	Very limited Flooding Shrink-swell	1.00 0.50
Holmquist, channeled-----	40	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50
Ld: LaDelle-----	90	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 0.50 0.47	Very limited Flooding Shrink-swell	1.00 0.50
Le: LaDelle, channeled--	85	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 0.50 0.47	Very limited Flooding Shrink-swell	1.00 0.50
Lk: Lamo-----	90	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 0.50 0.39	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 0.50 0.39

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Lm: Lamoure-----	85	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50
Ln: Lawet-----	85	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 0.98 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 0.98 0.50
Lo: Lawet, wet-----	90	Very limited Flooding Depth to saturated zone Ponding Shrink-swell	1.00 1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Ponding Shrink-swell	1.00 1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Ponding Shrink-swell	1.00 1.00 1.00 0.50
Lp: Lawet-----	60	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 0.98 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 0.98 0.50
Davison-----	30	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone Shrink-swell	0.99 0.50	Somewhat limited Shrink-swell	0.50
LrA: Lehr-----	55	Not limited		Not limited		Not limited	
Bowdle-----	35	Not limited		Not limited		Not limited	
LrB: Lehr-----	60	Not limited		Not limited		Somewhat limited Slope	0.12
Bowdle-----	30	Not limited		Not limited		Not limited	
Ls: Lowe-----	85	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50
Lt: Ludden-----	85	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Lu:							
Ludden, ponded-----	90	Very limited Ponding Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00 1.00	Very limited Ponding Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00 1.00	Very limited Ponding Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00 1.00
Lw:							
Ludden, wet-----	85	Very limited Ponding Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00 1.00	Very limited Ponding Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00 1.00	Very limited Ponding Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00 1.00
M-W:							
Miscellaneous water-	100	Not rated		Not rated		Not rated	
MaC:							
Maddock-----	50	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Very limited Slope	1.00
Egeland-----	35	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Very limited Slope	1.00
MdA:							
Max-----	50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
Arnegard-----	40	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone	0.47	Somewhat limited Shrink-swell	0.50
MdB:							
Max-----	60	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.12
Arnegard-----	30	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone	0.47	Somewhat limited Shrink-swell	0.50
MgB:							
Max-----	45	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.12
Arnegard-----	30	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone	0.47	Somewhat limited Shrink-swell	0.50
Zahl-----	20	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.12
MnB:							
Max-----	40	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.12

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MnB: (cont.)							
Niobell-----	30	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00
Noonan-----	20	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Somewhat limited Shrink-swell	0.50
MxC:							
Max-----	45	Somewhat limited Shrink-swell Slope	0.50 0.01	Somewhat limited Shrink-swell Slope	0.50 0.01	Very limited Slope Shrink-swell	1.00 0.50
Zahl-----	30	Somewhat limited Shrink-swell Slope	0.50 0.01	Somewhat limited Shrink-swell Slope	0.50 0.01	Very limited Slope Shrink-swell	1.00 0.50
Arnegard-----	20	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone	0.15	Somewhat limited Shrink-swell	0.50
My:							
Miranda-----	50	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone Shrink-swell	0.99 0.50	Somewhat limited Shrink-swell	0.50
Heil-----	40	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00
Mz:							
Moritz-----	55	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 0.50 0.07	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 0.50 0.07
Lowe-----	35	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50
Na:							
Nahon-----	45	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.47	Very limited Shrink-swell	1.00
Aberdeen-----	30	Very limited Shrink-swell	1.00	Somewhat limited Depth to saturated zone	0.47	Very limited Shrink-swell	1.00

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Na: (cont.) Exline-----	20	Very limited Shrink-swell	1.00	Somewhat limited Depth to saturated zone Shrink-swell	0.99 0.50	Very limited Shrink-swell	1.00
Nb: Nahon-----	45	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.47	Very limited Shrink-swell	1.00
Aberdeen-----	30	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00
Exline-----	20	Very limited Shrink-swell	1.00	Somewhat limited Depth to saturated zone Shrink-swell	0.99 0.50	Very limited Shrink-swell	1.00
Nc: Niobell-----	60	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00
Noonan-----	30	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Somewhat limited Shrink-swell	0.50
Nd: Niobell-----	40	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00
Noonan-----	30	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Somewhat limited Shrink-swell	0.50
Heil-----	20	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00
NeA: Niobell-----	40	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00
Noonan-----	30	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Somewhat limited Shrink-swell	0.50

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
NeA: (cont.) Max-----	20	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
Nm: Noonan-----	55	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Somewhat limited Shrink-swell	0.50
Miranda-----	35	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Somewhat limited Shrink-swell	0.50
Nr: Northville-----	60	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 0.61 0.50	Very limited Flooding Shrink-swell	1.00 0.50
Farmsworth-----	30	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 1.00 0.07	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 1.00 0.07
Nv: Northville-----	40	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 0.61 0.50	Very limited Flooding Shrink-swell	1.00 0.50
Farmsworth-----	30	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 1.00 0.07	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 1.00 0.07
Hoven-----	20	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00
Ov: Overshue-----	90	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
Pa: Parnell-----	90	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Pc: Parshall-----	85	Not limited		Not limited		Not limited	
PeA: Peever-----	85	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.15	Very limited Shrink-swell	1.00
PgB: Peever-----	60	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.15	Very limited Shrink-swell	1.00
Buse-----	30	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
PoA: Peever-----	60	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.15	Very limited Shrink-swell	1.00
Cavour-----	30	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00
Pp: Pits, gravel and sand-----	90	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Pr: Playmoor-----	85	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50
Py: Playmoor, channeled-	50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50
Lamoure, channeled--	40	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50
Ra: Ranslo-----	85	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 1.00 0.39	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 1.00 0.39

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Re:							
Ranslo-----	50	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 1.00 0.39	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 1.00 0.39
Harriet-----	40	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.50
RfA:							
Renshaw-----	55	Not limited		Not limited		Not limited	
Fordville-----	35	Not limited		Not limited		Not limited	
RfB:							
Renshaw-----	60	Not limited		Not limited		Not limited	
Fordville-----	30	Not limited		Not limited		Not limited	
So:							
Southam-----	90	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00
St:							
Stickney-----	60	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Somewhat limited Shrink-swell	0.50
Dudley-----	30	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00
Su:							
Stickney-----	40	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Somewhat limited Shrink-swell	0.50
Dudley-----	30	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00
Hoven-----	20	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Sw: Straw-----	85	Very limited Flooding	1.00	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 0.50 0.47	Very limited Flooding	1.00
Sx: Straw-----	90	Very limited Flooding	1.00	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 0.50 0.47	Very limited Flooding	1.00
TbE: Talmo, stony-----	45	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Ethan, stony-----	35	Very limited Slope Shrink-swell	1.00 0.50	Very limited Slope Shrink-swell	1.00 0.50	Very limited Slope Shrink-swell	1.00 0.50
Te: Tetonka-----	90	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00
Tk: Toko-----	90	Very limited Depth to saturated zone Ponding Shrink-swell	1.00 1.00 0.50	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding Shrink-swell	1.00 1.00 0.50
Tm: Toko, wet-----	90	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.50
Tn: Tonka-----	90	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00
To: Tonka-----	60	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
To: (cont.) Rimlap-----	30	Very limited Shrink-swell Ponding Depth to saturated zone	1.00 1.00 0.99	Very limited Depth to saturated zone Shrink-swell Ponding	1.00 1.00 1.00	Very limited Shrink-swell Ponding Depth to saturated zone	1.00 1.00 0.99
Us: Udorthents, silty---	90	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
Va: Vallars-----	60	Very limited Depth to saturated zone Shrink-swell	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Shrink-swell	1.00 0.50
Hamerly-----	30	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone Shrink-swell	0.99 0.50	Somewhat limited Shrink-swell	0.50
VgA: Vang-----	85	Not limited		Not limited		Not limited	
W: Water-----	100	Not rated		Not rated		Not rated	
WaA: Williams-----	50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
Bowbells-----	40	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Somewhat limited Shrink-swell	0.50
WaB: Williams-----	60	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.12
Bowbells-----	30	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Somewhat limited Shrink-swell	0.50
WbA: Williams-----	45	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
Bowbells-----	25	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Somewhat limited Shrink-swell	0.50

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WbA: (cont.) Tonka-----	20	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00
WbB: Williams-----	50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.12
Bowbells-----	25	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Somewhat limited Shrink-swell	0.50
Tonka-----	20	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00
WcA: Williams-----	55	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
Niobell-----	30	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00
WcB: Williams-----	60	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.12
Niobell-----	30	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00
WdA: Williams-----	45	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
Niobell-----	25	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Very limited Shrink-swell	1.00
Tonka-----	20	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WhD:							
Williams-----	50	Somewhat limited Shrink-swell Slope	0.50 0.01	Somewhat limited Shrink-swell Slope	0.50 0.01	Very limited Slope Shrink-swell	1.00 0.50
Vida-----	40	Somewhat limited Slope Shrink-swell	0.63 0.50	Somewhat limited Slope Shrink-swell	0.63 0.50	Very limited Slope Shrink-swell	1.00 0.50
WmB:							
Williams-----	50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.12
Zahl-----	25	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.12
Bowbells-----	20	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.47	Somewhat limited Shrink-swell	0.50
WmC:							
Williams-----	45	Somewhat limited Shrink-swell Slope	0.50 0.01	Somewhat limited Shrink-swell Slope	0.50 0.01	Very limited Slope Shrink-swell	1.00 0.50
Zahl-----	30	Somewhat limited Shrink-swell Slope	0.50 0.01	Somewhat limited Shrink-swell Slope	0.50 0.01	Very limited Slope Shrink-swell	1.00 0.50
Bowbells-----	20	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to saturated zone	0.50 0.15	Somewhat limited Shrink-swell Slope	0.50 0.12
Wn:							
Winship-----	60	Not limited		Somewhat limited Depth to saturated zone Shrink-swell	0.99 0.50	Not limited	
Tonka-----	30	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00
Wo:							
Winship-----	60	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone Shrink-swell	0.99 0.50	Somewhat limited Shrink-swell	0.50

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Wo: (cont.) Tonka-----	30	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00
Ws: Woonsocket-----	50	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to saturated zone	0.61	Somewhat limited Shrink-swell	0.50
Whitelake-----	35	Not limited		Somewhat limited Depth to saturated zone	0.61	Not limited	
Wt: Worthing, ponded----	90	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00
Ww: Worthing-----	90	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Shrink-swell	1.00 1.00 1.00
ZaE: Zahill-----	85	Very limited Slope Shrink-swell	1.00 0.50	Very limited Slope Shrink-swell	1.00 0.50	Very limited Slope Shrink-swell	1.00 0.50
ZbC: Zahl-----	50	Somewhat limited Shrink-swell Slope	0.50 0.01	Somewhat limited Shrink-swell Slope	0.50 0.01	Very limited Slope Shrink-swell	1.00 0.50
Max-----	40	Somewhat limited Shrink-swell Slope	0.50 0.01	Somewhat limited Shrink-swell Slope	0.50 0.01	Very limited Slope Shrink-swell	1.00 0.50
ZbD: Zahl-----	55	Very limited Slope Shrink-swell	1.00 0.50	Very limited Slope Shrink-swell	1.00 0.50	Very limited Slope Shrink-swell	1.00 0.50
Max-----	35	Somewhat limited Slope Shrink-swell	0.63 0.50	Somewhat limited Slope Shrink-swell	0.63 0.50	Very limited Slope Shrink-swell	1.00 0.50
ZgD: Zell-----	55	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Great Bend-----	35	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Very limited Slope	1.00

Roads and Streets, Shallow Excavations, and Lawns and Landscaping

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Aa: Aastad-----	85	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.61 0.10	Not limited	
Ab: Aastad-----	50	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.61 0.10	Not limited	
Hamerly-----	35	Very limited Frost action Low strength Shrink-swell	1.00 0.78 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.99 0.10	Not limited	
Ad: Aastad-----	60	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.61 0.10	Not limited	
Tonka-----	30	Very limited Ponding Depth to saturated zone Frost action Low strength Shrink-swell	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Cutbanks cave	1.00 1.00 0.10	Very limited Ponding Depth to saturated zone	1.00 1.00
Ae: Aberdeen-----	55	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Too clayey	1.00 0.47 0.12	Not limited	
Nahon-----	35	Very limited Shrink-swell Low strength Frost action	1.00 1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Too clayey	1.00 0.47 0.12	Very limited Sodium content	1.00
Ah: Aberdeen-----	55	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Too clayey	1.00 0.47 0.12	Not limited	
Nahon-----	35	Very limited Shrink-swell Low strength Frost action	1.00 1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Too clayey	1.00 0.47 0.12	Very limited Sodium content	1.00

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
An: Aberdeen-----	45	Very limited Low strength Shrink-swell Frost action	 1.00 1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Too clayey	 1.00 0.47 0.12	Not limited	
Nahon-----	25	Very limited Shrink-swell Low strength Frost action	 1.00 1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Too clayey	 1.00 0.47 0.12	Very limited Sodium content	1.00
Heil-----	20	Very limited Depth to saturated zone Frost action Shrink-swell Low strength Ponding	 1.00 1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Cutbanks cave Ponding Too clayey	 1.00 1.00 1.00 0.72	Very limited Depth to saturated zone Sodium content Ponding	1.00 1.00 1.00
Ao: Aberdeen-----	45	Very limited Low strength Shrink-swell Frost action	 1.00 1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Too clayey	 1.00 0.47 0.12	Not limited	
Nahon-----	25	Very limited Shrink-swell Low strength Frost action	 1.00 1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Too clayey	 1.00 0.47 0.12	Very limited Sodium content	1.00
Heil-----	20	Very limited Depth to saturated zone Frost action Shrink-swell Low strength Ponding	 1.00 1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Cutbanks cave Ponding Too clayey	 1.00 1.00 1.00 0.72	Very limited Depth to saturated zone Sodium content Ponding	1.00 1.00 1.00
At: Aguents, loamy-----	90	Very limited Ponding Depth to saturated zone Frost action Low strength Shrink-swell	 1.00 1.00 1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Cutbanks cave	 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
BaC: Beadle-----	80	Very limited Shrink-swell Low strength Frost action Slope	 1.00 1.00 0.50 0.01	Somewhat limited Cutbanks cave Slope	 0.10 0.01	Somewhat limited Slope	0.01

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BdA:							
Beadle-----	50	Very limited Shrink-swell Low strength Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.15 0.10	Not limited	
Dudley-----	35	Very limited Shrink-swell Low strength Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Very limited Sodium content	1.00
BeA:							
Beadle-----	60	Very limited Shrink-swell Low strength Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.15 0.10	Not limited	
Stickney-----	30	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
BeB:							
Beadle-----	60	Very limited Shrink-swell Low strength Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.15 0.10	Not limited	
Stickney-----	30	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
BfA:							
Beadle, stony-----	60	Very limited Shrink-swell Low strength Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.15 0.10	Somewhat limited Large stones content	0.32
Stickney, stony-----	30	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
BfB:							
Beadle, stony-----	60	Very limited Shrink-swell Low strength Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.15 0.10	Not limited	
Stickney, stony-----	30	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
Bg:							
Bearden-----	85	Very limited Frost action Low strength Shrink-swell	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.99 0.10	Not limited	

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Bk:							
Bearden-----	60	Very limited Frost action Low strength Shrink-swell	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.99 0.10	Not limited	
Tonka-----	30	Very limited Ponding Depth to saturated zone Frost action Low strength Shrink-swell	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Cutbanks cave	1.00 1.00 0.10	Very limited Ponding Depth to saturated zone	1.00 1.00
Bo:							
Beotia-----	90	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Very limited Cutbanks cave Depth to saturated zone	1.00 0.15	Not limited	
Br:							
Beotia-----	50	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Very limited Cutbanks cave Depth to saturated zone	1.00 0.15	Not limited	
Rondell-----	35	Very limited Frost action Low strength Shrink-swell	1.00 1.00 0.50	Very limited Cutbanks cave Depth to saturated zone	1.00 0.47	Not limited	
Bs:							
Beotia-----	60	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Very limited Cutbanks cave Depth to saturated zone	1.00 0.47	Not limited	
Winship-----	30	Very limited Frost action Low strength	1.00 1.00	Somewhat limited Depth to saturated zone Cutbanks cave	0.99 0.10	Not limited	
Bt:							
Beotia-----	60	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Very limited Cutbanks cave Depth to saturated zone	1.00 0.47	Not limited	
Winship-----	30	Very limited Frost action Low strength Shrink-swell	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.99 0.10	Not limited	
Bu:							
Bon-----	90	Somewhat limited Frost action Flooding	0.50 0.40	Very limited Cutbanks cave Depth to saturated zone	1.00 0.61	Not limited	

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Bw: Bon, channeled-----	85	Very limited Frost action Flooding	1.00 1.00	Very limited Cutbanks cave Flooding Depth to saturated zone	1.00 0.80 0.61	Very limited Flooding	1.00
BxD: Buse-----	55	Very limited Slope Low strength Shrink-swell Frost action	1.00 0.78 0.50 0.50	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
Barnes-----	35	Very limited Low strength Slope Shrink-swell Frost action	1.00 0.63 0.50 0.50	Somewhat limited Slope Cutbanks cave	0.63 0.10	Somewhat limited Slope	0.63
ByE: Buse, stony-----	50	Very limited Slope Shrink-swell Frost action Low strength	1.00 0.50 0.50 0.22	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope Large stones content	1.00 0.01
Barnes, stony-----	35	Very limited Slope Low strength Frost action	1.00 0.78 0.50	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope Large stones content	1.00 0.05
BzE: Buse-----	50	Very limited Slope Low strength Shrink-swell Frost action	1.00 0.78 0.50 0.50	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
Langhei-----	40	Very limited Slope Low strength Frost action	1.00 1.00 0.50	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
Ca: Camtown-----	55	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Very limited Sodium content	1.00
Turton-----	30	Somewhat limited Low strength Shrink-swell Frost action	0.78 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Very limited Sodium content	1.00

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Cf:							
Cavour-----	55	Very limited Shrink-swell Low strength Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave Too clayey	0.47 0.10 0.03	Very limited Sodium content	1.00
Ferney-----	35	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Very limited Sodium content	1.00
Co:							
Colvin, saline-----	85	Very limited Ponding Depth to saturated zone Frost action Low strength Shrink-swell	1.00 1.00 1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Cutbanks cave	1.00 1.00 0.10	Very limited Ponding Depth to saturated zone Salinity	1.00 1.00 1.00
Cr:							
Cresbard-----	60	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
Cavour-----	30	Very limited Shrink-swell Low strength Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave Too clayey	0.47 0.10 0.03	Very limited Sodium content	1.00
Cs:							
Cresbard-----	40	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
Cavour-----	30	Very limited Shrink-swell Low strength Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave Too clayey	0.47 0.10 0.03	Very limited Sodium content	1.00
Heil-----	20	Very limited Depth to saturated zone Frost action Shrink-swell Low strength Ponding	1.00 1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Cutbanks cave Ponding Too clayey	1.00 1.00 1.00 0.72	Very limited Depth to saturated zone Sodium content Ponding	1.00 1.00 1.00

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ct: Crossplain-----	60	Very limited Frost action Flooding Low strength Shrink-swell Depth to saturated zone	1.00 1.00 1.00 1.00 0.99	Very limited Depth to saturated zone Flooding Cutbanks cave	1.00 0.80 0.10	Very limited Flooding Depth to saturated zone	1.00 0.99
Tetonka-----	30	Very limited Depth to saturated zone Frost action Low strength Shrink-swell Ponding	1.00 1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Ponding Too clayey Cutbanks cave	1.00 1.00 0.28 0.10	Very limited Depth to saturated zone Ponding	1.00 1.00
Da: Davis-----	55	Very limited Low strength Shrink-swell Frost action Flooding	1.00 0.50 0.50 0.40	Somewhat limited Depth to saturated zone Cutbanks cave	0.61 0.10	Not limited	
Northville-----	35	Very limited Low strength Shrink-swell Frost action Flooding	1.00 0.50 0.50 0.40	Somewhat limited Depth to saturated zone Cutbanks cave Too clayey	0.61 0.10 0.03	Not limited	
Db: Davison-----	85	Very limited Frost action Shrink-swell	1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.99 0.10	Not limited	
Dd: Davison-----	50	Very limited Frost action Shrink-swell	1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.99 0.10	Not limited	
Tetonka-----	40	Very limited Depth to saturated zone Frost action Low strength Shrink-swell Ponding	1.00 1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Ponding Too clayey Cutbanks cave	1.00 1.00 0.28 0.10	Very limited Depth to saturated zone Ponding	1.00 1.00
DeA: Delmont-----	55	Not limited		Very limited Cutbanks cave	1.00	Somewhat limited Droughty	0.01
Enet-----	35	Not limited		Very limited Cutbanks cave	1.00	Not limited	

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Dk: Dimo-----	85	Very limited Low strength Shrink-swell Frost action Flooding	1.00 0.50 0.50 0.40	Very limited Cutbanks cave Depth to saturated zone	1.00 0.61	Not limited	
Dm: Dimo-----	55	Very limited Low strength Shrink-swell Frost action Flooding Depth to saturated zone	1.00 0.50 0.50 0.40 0.03	Very limited Depth to saturated zone Cutbanks cave	1.00 1.00	Somewhat limited Depth to saturated zone	0.03
Grat-----	30	Very limited Depth to saturated zone Frost action Low strength Shrink-swell Ponding	1.00 1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Cutbanks cave Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
DoA: Doland-----	50	Somewhat limited Low strength Frost action	0.78 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.15 0.10	Not limited	
Embden-----	30	Somewhat limited Frost action	0.50	Very limited Cutbanks cave Depth to saturated zone	1.00 0.61	Not limited	
Dq: Dovecreek-----	90	Very limited Frost action Low strength Shrink-swell Flooding	1.00 1.00 0.50 0.40	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
Dr: Dovray-----	90	Very limited Ponding Depth to saturated zone Frost action Low strength Shrink-swell	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Too clayey Cutbanks cave	1.00 1.00 0.50 0.10	Very limited Ponding Depth to saturated zone Too clayey	1.00 1.00 1.00
Du: Dudley-----	55	Very limited Shrink-swell Low strength Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Very limited Sodium content	1.00

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Du: (cont.) Jerauld-----	35	Very limited Low strength Shrink-swell Frost action	 1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	 0.47 0.10	Very limited Sodium content	 1.00
Dx: Durrstein-----	85	Very limited Depth to saturated zone Frost action Flooding Shrink-swell Low strength	 1.00 1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Flooding Cutbanks cave	 1.00 0.80 0.10	Very limited Flooding Sodium content Depth to saturated zone Salinity	 1.00 1.00 1.00 1.00
Ea: Eckman-----	85	Somewhat limited Frost action	 0.50	Somewhat limited Cutbanks cave	 0.10	Not limited	
EcA: Eckman-----	50	Somewhat limited Frost action	 0.50	Somewhat limited Cutbanks cave	 0.10	Not limited	
Gardena-----	40	Somewhat limited Frost action	 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	 0.61 0.10	Not limited	
EcB: Eckman-----	60	Somewhat limited Frost action	 0.50	Somewhat limited Cutbanks cave	 0.10	Not limited	
Gardena-----	30	Somewhat limited Frost action	 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	 0.61 0.10	Not limited	
EdB: Eckman-----	60	Somewhat limited Frost action	 0.50	Somewhat limited Cutbanks cave	 0.10	Not limited	
Zell-----	30	Very limited Low strength Frost action	 1.00 0.50	Somewhat limited Cutbanks cave	 0.10	Not limited	
EeB: Edgeley-----	85	Very limited Low strength Shrink-swell Frost action	 1.00 0.50 0.50	Somewhat limited Depth to soft bedrock Cutbanks cave	 0.42 0.10	Somewhat limited Depth to bedrock	 0.42
EeC: Edgeley-----	85	Very limited Low strength Shrink-swell Frost action Slope	 1.00 0.50 0.50 0.01	Somewhat limited Depth to soft bedrock Cutbanks cave Slope	 0.42 0.10 0.01	Somewhat limited Depth to bedrock Slope	 0.42 0.01

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
EeD: Edgeley-----	85	Very limited Slope Low strength Shrink-swell Frost action	1.00 1.00 0.50 0.50	Very limited Slope Depth to soft bedrock Cutbanks cave	1.00 0.42 0.10	Very limited Slope Depth to bedrock	1.00 0.42
EgA: Egeland-----	50	Somewhat limited Frost action	0.50	Very limited Cutbanks cave	1.00	Not limited	
Embden-----	40	Somewhat limited Frost action	0.50	Very limited Cutbanks cave Depth to saturated zone	1.00 0.61	Not limited	
EgB: Egeland-----	50	Somewhat limited Frost action	0.50	Very limited Cutbanks cave	1.00	Not limited	
Embden-----	35	Somewhat limited Frost action	0.50	Very limited Cutbanks cave Depth to saturated zone	1.00 0.61	Not limited	
Ek: Elsmere-----	85	Somewhat limited Frost action Depth to saturated zone	0.50 0.03	Very limited Depth to saturated zone Cutbanks cave	1.00 1.00	Somewhat limited Depth to saturated zone Droughty	0.03 0.01
EmE: Ethan-----	50	Very limited Slope Low strength Shrink-swell Frost action	1.00 1.00 0.50 0.50	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
Betts-----	40	Very limited Slope Low strength Shrink-swell Frost action	1.00 1.00 0.50 0.50	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
EnD: Ethan-----	55	Very limited Slope Low strength Shrink-swell Frost action	1.00 1.00 0.50 0.50	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
Hand-----	35	Somewhat limited Slope Shrink-swell Frost action Low strength	0.63 0.50 0.50 0.22	Somewhat limited Slope Cutbanks cave	0.63 0.10	Somewhat limited Slope	0.63

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Er:							
Exline-----	50	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Too clayey	1.00 0.99 0.12	Very limited Sodium content	1.00
Aberdeen-----	25	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Too clayey	1.00 0.47 0.12	Not limited	
Nahon-----	20	Very limited Shrink-swell Low strength Frost action	1.00 1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Too clayey	1.00 0.47 0.12	Very limited Sodium content	1.00
Et:							
Exline-----	50	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Too clayey	1.00 0.99 0.12	Very limited Sodium content	1.00
Aberdeen-----	25	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Too clayey	1.00 0.47 0.12	Not limited	
Nahon-----	20	Very limited Shrink-swell Low strength Frost action	1.00 1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Too clayey	1.00 0.47 0.12	Very limited Sodium content	1.00
Ew:							
Exline-----	50	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Too clayey	1.00 0.99 0.12	Very limited Sodium content	1.00
Heil-----	40	Very limited Depth to saturated zone Frost action Shrink-swell Low strength Ponding	1.00 1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Cutbanks cave Ponding Too clayey	1.00 1.00 1.00 1.00 0.72	Very limited Depth to saturated zone Sodium content Ponding	1.00 1.00 1.00
Ex:							
Exline-----	50	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Too clayey	1.00 0.99 0.12	Very limited Sodium content	1.00

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ex: (cont.) Heil-----	40	Very limited Depth to saturated zone Frost action Shrink-swell Low strength Ponding	1.00 1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Cutbanks cave Ponding Too clayey	1.00 1.00 1.00 0.72	Very limited Depth to saturated zone Sodium content Ponding	1.00 1.00 1.00
EyA: Exline-----	45	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Too clayey	1.00 0.47 0.12	Very limited Sodium content	1.00
Putney-----	40	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Very limited Cutbanks cave Depth to saturated zone	1.00 0.15	Not limited	
Fa: Farmsworth-----	50	Very limited Low strength Shrink-swell Frost action Flooding Depth to saturated zone	1.00 1.00 0.50 0.40 0.03	Very limited Depth to saturated zone Cutbanks cave	1.00 0.10	Very limited Sodium content Depth to saturated zone	1.00 0.03
Durrstein-----	35	Very limited Depth to saturated zone Frost action Flooding Shrink-swell Low strength	1.00 1.00 1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Flooding Cutbanks cave	1.00 0.80 0.10	Very limited Flooding Sodium content Depth to saturated zone Salinity	1.00 1.00 1.00 1.00
Fe: Ferney-----	50	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.99 0.10	Very limited Sodium content	1.00
Heil-----	40	Very limited Depth to saturated zone Frost action Shrink-swell Low strength Ponding	1.00 1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Cutbanks cave Ponding Too clayey	1.00 1.00 1.00 0.72	Very limited Depth to saturated zone Sodium content Ponding	1.00 1.00 1.00
Ff: Forestburg-----	60	Somewhat limited Frost action	0.50	Very limited Cutbanks cave Depth to saturated zone	1.00 0.90	Not limited	

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ff: (cont.) Elsmere-----	30	Very limited Frost action Depth to saturated zone	1.00 0.19	Very limited Depth to saturated zone Cutbanks cave	1.00 1.00	Somewhat limited Depth to saturated zone Droughty	0.19 0.01
Fh: Forestburg-----	45	Somewhat limited Frost action	0.50	Very limited Cutbanks cave Depth to saturated zone	1.00 0.90	Not limited	
Elsmere-----	25	Very limited Frost action Depth to saturated zone	1.00 0.19	Very limited Depth to saturated zone Cutbanks cave	1.00 1.00	Somewhat limited Depth to saturated zone Droughty	0.19 0.01
Toko-----	20	Very limited Depth to saturated zone Frost action Ponding Shrink-swell	1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Ponding Cutbanks cave	1.00 1.00 0.10	Very limited Depth to saturated zone Ponding	1.00 1.00
FmA: Forman-----	50	Somewhat limited Low strength Shrink-swell Frost action	0.78 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.15 0.10	Not limited	
Aastad-----	40	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.61 0.10	Not limited	
FmB: Forman-----	60	Somewhat limited Low strength Shrink-swell Frost action	0.78 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.15 0.10	Not limited	
Aastad-----	30	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.61 0.10	Not limited	
FnC: Forman-----	55	Somewhat limited Low strength Shrink-swell Frost action Slope	0.78 0.50 0.50 0.01	Somewhat limited Cutbanks cave Slope	0.10 0.01	Somewhat limited Slope	0.01
Buse-----	35	Somewhat limited Low strength Shrink-swell Frost action Slope	0.78 0.50 0.50 0.01	Somewhat limited Cutbanks cave Slope	0.10 0.01	Somewhat limited Slope	0.01

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FrB:							
Forman-----	50	Somewhat limited Low strength Shrink-swell Frost action	0.78 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.15 0.10	Not limited	
Buse-----	25	Somewhat limited Low strength Shrink-swell Frost action	0.78 0.50 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Aastad-----	20	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.61 0.10	Not limited	
FrC:							
Forman-----	45	Somewhat limited Low strength Shrink-swell Frost action Slope	0.78 0.50 0.50 0.01	Somewhat limited Cutbanks cave Slope	0.10 0.01	Somewhat limited Slope	0.01
Buse-----	30	Somewhat limited Low strength Shrink-swell Frost action Slope	0.78 0.50 0.50 0.01	Somewhat limited Cutbanks cave Slope	0.10 0.01	Somewhat limited Slope	0.01
Aastad-----	20	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.61 0.10	Not limited	
FsA:							
Forman-----	55	Somewhat limited Low strength Shrink-swell Frost action	0.78 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.15 0.10	Not limited	
Cresbard-----	30	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
FsB:							
Forman-----	60	Somewhat limited Low strength Shrink-swell Frost action	0.78 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.15 0.10	Not limited	
Cresbard-----	30	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FtA:							
Forman-----	45	Somewhat limited Low strength Shrink-swell	0.78 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.15 0.10	Not limited	
Cresbard-----	25	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
Tonka-----	20	Very limited Ponding Depth to saturated zone Frost action Low strength Shrink-swell	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Cutbanks cave	1.00 1.00 0.10	Very limited Ponding Depth to saturated zone	1.00 1.00
Ga:							
Gardena-----	90	Somewhat limited Frost action	0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.61 0.10	Not limited	
Gd:							
Gardena-----	55	Somewhat limited Frost action	0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.61 0.10	Not limited	
Glyndon-----	35	Very limited Frost action	1.00	Somewhat limited Depth to saturated zone Cutbanks cave	0.90 0.10	Not limited	
Ge:							
Gardena-----	50	Somewhat limited Frost action	0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.61 0.10	Not limited	
Turton-----	35	Somewhat limited Low strength Shrink-swell Frost action	0.78 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Very limited Sodium content	1.00
GgA:							
Great Bend-----	90	Very limited Low strength Frost action	1.00 0.50	Very limited Cutbanks cave Depth to saturated zone	1.00 0.15	Not limited	
GnA:							
Great Bend-----	50	Very limited Low strength Frost action	1.00 0.50	Very limited Cutbanks cave Depth to saturated zone	1.00 0.15	Not limited	

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GnA: (cont.) Beotia-----	40	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Very limited Cutbanks cave Depth to saturated zone	1.00 0.15	Not limited	
GnB: Great Bend-----	60	Very limited Low strength Frost action	1.00 0.50	Very limited Cutbanks cave Depth to saturated zone	1.00 0.15	Not limited	
Beotia-----	30	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Very limited Cutbanks cave Depth to saturated zone	1.00 0.15	Not limited	
GoA: Great Bend-----	50	Very limited Low strength Frost action	1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.15 0.10	Not limited	
Beotia-----	40	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Very limited Cutbanks cave Depth to saturated zone	1.00 0.15	Not limited	
GpA: Great Bend-----	50	Very limited Low strength Frost action	1.00 0.50	Very limited Cutbanks cave Depth to saturated zone	1.00 0.15	Not limited	
Putney-----	35	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Very limited Cutbanks cave Depth to saturated zone	1.00 0.15	Not limited	
GpB: Great Bend-----	50	Very limited Low strength Frost action	1.00 0.50	Very limited Cutbanks cave Depth to saturated zone	1.00 0.15	Not limited	
Putney-----	35	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Very limited Cutbanks cave Depth to saturated zone	1.00 0.15	Not limited	
GtB: Great Bend-----	60	Very limited Low strength Frost action	1.00 0.50	Very limited Cutbanks cave Depth to saturated zone	1.00 0.15	Not limited	
Zell-----	30	Very limited Low strength Frost action	1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GtC:							
Great Bend-----	50	Very limited Low strength Frost action Slope	1.00 0.50 0.01	Very limited Cutbanks cave Slope	1.00 0.01	Somewhat limited Slope	0.01
Zell-----	40	Very limited Low strength Frost action Slope	1.00 0.50 0.01	Somewhat limited Cutbanks cave Slope	0.10 0.01	Somewhat limited Slope	0.01
GzC:							
Great Bend-----	45	Very limited Low strength Frost action	1.00 0.50	Very limited Cutbanks cave	1.00	Not limited	
Zell-----	25	Very limited Low strength Frost action Slope	1.00 0.50 0.01	Somewhat limited Cutbanks cave Slope	0.10 0.01	Somewhat limited Slope	0.01
Huffton-----	20	Very limited Low strength Shrink-swell Frost action Slope	1.00 0.50 0.50 0.01	Somewhat limited Cutbanks cave Slope	0.10 0.01	Somewhat limited Slope	0.01
HaA:							
Hamerly-----	85	Very limited Frost action Low strength Shrink-swell	1.00 0.78 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.99 0.10	Not limited	
Hb:							
Hamerly-----	50	Very limited Frost action Low strength Shrink-swell	1.00 0.78 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.99 0.10	Not limited	
Tonka-----	40	Very limited Ponding Depth to saturated zone Frost action Low strength Shrink-swell	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Cutbanks cave	1.00 1.00 0.10	Very limited Ponding Depth to saturated zone	1.00 1.00
HcA:							
Hand-----	50	Somewhat limited Shrink-swell Frost action Low strength	0.50 1.50 0.22	Somewhat limited Depth to saturated zone Cutbanks cave	0.15 0.10	Not limited	
Bonilla-----	40	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HcB:							
Hand-----	60	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Depth to	0.15		
		Frost action	0.50	saturated zone			
		Low strength	0.22	Cutbanks cave	0.10		
Bonilla-----	30	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Depth to	0.47		
		Shrink-swell	0.50	saturated zone			
		Frost action	0.50	Cutbanks cave	0.10		
HdA:							
Hand-----	50	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Depth to	0.15		
		Frost action	0.50	saturated zone			
		Low strength	0.22	Cutbanks cave	0.10		
Carthage-----	40	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Depth to	0.82		
		Shrink-swell	0.50	saturated zone			
		Frost action	0.50	Cutbanks cave	0.10		
He:							
Hand-----	45	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Depth to	0.15		
		Frost action	0.50	saturated zone			
		Low strength	0.22	Cutbanks cave	0.10		
Carthage-----	25	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Depth to	0.82		
		Shrink-swell	0.50	saturated zone			
		Frost action	0.50	Cutbanks cave	0.10		
Overshue-----	20	Very limited		Very limited		Very limited	
		Depth to	1.00	Depth to	1.00	Depth to	1.00
		saturated zone		saturated zone		saturated zone	
		Frost action	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00	Cutbanks cave	0.10		
HfC:							
Hand-----	55	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Cutbanks cave	0.10	Slope	0.01
		Frost action	0.50	Slope	0.01		
		Low strength	0.22				
		Slope	0.01				
Ethan-----	35	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Cutbanks cave	0.10	Slope	0.01
		Shrink-swell	0.50	Slope	0.01		
		Frost action	0.50				
		Slope	0.01				
HgB:							
Hand-----	50	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Depth to	0.15		
		Frost action	0.50	saturated zone			
		Low strength	0.22	Cutbanks cave	0.10		

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HgB: (cont.)							
Ethan-----	25	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Bonilla-----	20	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Depth to	0.47		
		Shrink-swell	0.50	saturated zone			
		Frost action	0.50	Cutbanks cave	0.10		
HgC:							
Hand-----	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Cutbanks cave	0.10	Slope	0.01
		Frost action	0.50	Slope	0.01		
		Low strength	0.22				
		Slope	0.01				
Ethan-----	30	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Cutbanks cave	0.10	Slope	0.01
		Shrink-swell	0.50	Slope	0.01		
		Frost action	0.50				
		Slope	0.01				
Bonilla-----	20	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Depth to	0.47		
		Shrink-swell	0.50	saturated zone			
		Frost action	0.50	Cutbanks cave	0.10		
HhB:							
Hand-----	50	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Depth to	0.15		
		Frost action	0.50	saturated zone			
		Low strength	0.22	Cutbanks cave	0.10		
Ethan-----	25	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Carthage-----	20	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Depth to	0.82		
		Shrink-swell	0.50	saturated zone			
		Frost action	0.50	Cutbanks cave	0.10		
HjB:							
Hand-----	45	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Depth to	0.15		
		Frost action	0.50	saturated zone			
		Low strength	0.22	Cutbanks cave	0.10		
Talmo-----	35	Not limited		Very limited		Somewhat limited	
				Cutbanks cave	1.00	Droughty	0.51

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HjC: Hand-----	45	Somewhat limited Shrink-swell Frost action Low strength Slope	0.50 0.50 0.22 0.01	Somewhat limited Cutbanks cave Slope	0.10 0.01	Somewhat limited Slope	0.01
Talmo-----	35	Somewhat limited Slope	0.01	Very limited Cutbanks cave Slope	1.00 0.01	Somewhat limited Droughty Slope	0.51 0.01
Hk: Harmony-----	55	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Too clayey	1.00 0.47 0.03	Not limited	
Aberdeen-----	35	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Too clayey	1.00 0.47 0.12	Not limited	
Hm: Harmony-----	55	Very limited Shrink-swell Low strength Frost action	1.00 1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Too clayey	1.00 0.47 0.03	Not limited	
Aberdeen-----	35	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Too clayey	1.00 0.47 0.12	Not limited	
Hn: Harmony-----	55	Very limited Shrink-swell Low strength Frost action	1.00 1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Too clayey	1.00 0.47 0.03	Not limited	
Beotia-----	35	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Very limited Cutbanks cave Depth to saturated zone	1.00 0.15	Not limited	
Ho: Harmony-----	55	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Too clayey	1.00 0.47 0.03	Not limited	
Beotia-----	35	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Very limited Cutbanks cave Depth to saturated zone	1.00 0.15	Not limited	

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Hp: Harriet-----	90	Very limited Depth to saturated zone Frost action Flooding Low strength Shrink-swell	1.00 1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Flooding Cutbanks cave	1.00 0.60 0.10	Very limited Sodium content Depth to saturated zone Flooding	1.00 1.00 0.60
Hr: Heil-----	90	Very limited Depth to saturated zone Frost action Shrink-swell Low strength Ponding	1.00 1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Cutbanks cave Ponding Too clayey	1.00 1.00 1.00 0.72	Very limited Depth to saturated zone Sodium content Ponding	1.00 1.00 1.00
HsA: Henkin-----	55	Somewhat limited Frost action	0.50	Very limited Cutbanks cave	1.00	Not limited	
Blendon-----	35	Somewhat limited Frost action	0.50	Very limited Cutbanks cave Depth to saturated zone	1.00 0.15	Not limited	
HsB: Henkin-----	60	Somewhat limited Frost action	0.50	Very limited Cutbanks cave	1.00	Not limited	
Blendon-----	30	Somewhat limited Frost action	0.50	Very limited Cutbanks cave Depth to saturated zone	1.00 0.15	Not limited	
HtB: Houdek-----	50	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.15 0.10	Not limited	
Ethan-----	25	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Prosper-----	20	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
HtC: Houdek-----	45	Very limited Low strength Shrink-swell Frost action Slope	1.00 0.50 0.50 0.01	Somewhat limited Cutbanks cave Slope	0.10 0.01	Somewhat limited Slope	0.01

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HtC: (cont.)							
Ethan-----	30	Very limited Low strength Shrink-swell Frost action Slope	1.00 0.50 0.50 0.01	Somewhat limited Cutbanks cave Slope	0.10 0.01	Somewhat limited Slope	0.01
Prosper-----	20	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
HuA:							
Houdek-----	50	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.15 0.10	Not limited	
Prosper-----	40	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
HuB:							
Houdek-----	60	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.15 0.10	Not limited	
Prosper-----	30	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
HwA:							
Houdek-----	55	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.15 0.10	Not limited	
Stickney-----	35	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
HxA:							
Houdek-----	45	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.15 0.10	Not limited	
Stickney-----	25	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HxA: (cont.) Tetonka-----	20	Very limited Depth to saturated zone Frost action Low strength Shrink-swell Ponding	1.00 1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Ponding Too clayey Cutbanks cave	1.00 1.00 0.28 0.10	Very limited Depth to saturated zone Ponding	1.00 1.00
Hy: Hoven-----	90	Very limited Depth to saturated zone Frost action Shrink-swell Low strength Ponding	1.00 1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Ponding Too clayey Cutbanks cave	1.00 1.00 0.28 0.10	Very limited Depth to saturated zone Sodium content Ponding	1.00 1.00 1.00
Ie: Ipage-----	45	Somewhat limited Frost action	0.50	Very limited Cutbanks cave Depth to saturated zone	1.00 0.47	Somewhat limited Droughty	0.64
Els-----	25	Somewhat limited Frost action Depth to saturated zone	0.50 0.03	Very limited Depth to saturated zone Cutbanks cave	1.00 1.00	Somewhat limited Droughty Depth to saturated zone	0.43 0.03
Shue-----	20	Very limited Depth to saturated zone Frost action Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Cutbanks cave Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
Jh: Jerauld-----	50	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.99 0.10	Very limited Sodium content	1.00
Hoven-----	40	Very limited Depth to saturated zone Frost action Shrink-swell Low strength Ponding	1.00 1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Ponding Too clayey Cutbanks cave	1.00 1.00 0.28 0.10	Very limited Depth to saturated zone Sodium content Ponding	1.00 1.00 1.00
KaA: Kranzburg-----	50	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.15 0.10	Not limited	
Brookings-----	40	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.61 0.10	Not limited	

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KbB:							
Kranzburg-----	40	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Depth to	0.15		
		Shrink-swell	0.50	saturated zone			
		Frost action	0.50	Cutbanks cave	0.10		
Brookings-----	30	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Depth to	0.61		
		Shrink-swell	0.50	saturated zone			
		Frost action	0.50	Cutbanks cave	0.10		
Buse-----	25	Somewhat limited		Somewhat limited		Not limited	
		Low strength	0.78	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
KcA:							
Kranzburg-----	55	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Depth to	0.15		
		Shrink-swell	0.50	saturated zone			
		Frost action	0.50	Cutbanks cave	0.10		
Cresbard-----	30	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Depth to	0.47		
		Shrink-swell	1.00	saturated zone			
		Frost action	0.50	Cutbanks cave	0.10		
KtA:							
Kranzburg-----	45	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Depth to	0.15		
		Shrink-swell	0.50	saturated zone			
		Frost action	0.50	Cutbanks cave	0.10		
Cresbard-----	25	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Depth to	0.47		
		Shrink-swell	1.00	saturated zone			
		Frost action	0.50	Cutbanks cave	0.10		
Tonka-----	20	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to	1.00	Depth to	1.00	Depth to	1.00
		saturated zone		saturated zone		saturated zone	
		Frost action	1.00	Cutbanks cave	0.10		
		Low strength	1.00				
		Shrink-swell	1.00				
KzB:							
Kranzburg-----	40	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Depth to	0.15		
		Shrink-swell	0.50	saturated zone			
		Frost action	0.50	Cutbanks cave	0.10		
Zell-----	30	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Frost action	0.50				
Aastad-----	20	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Depth to	0.61		
		Shrink-swell	0.50	saturated zone			
		Frost action	0.50	Cutbanks cave	0.10		

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
La: La Prairie-----	85	Very limited Low strength Shrink-swell Frost action Flooding	 1.00 0.50 0.50 0.40	Very limited Cutbanks cave Depth to saturated zone	 1.00 0.47	Not limited	
Lc: La Prairie, channeled-----	50	Very limited Frost action Flooding Low strength Shrink-swell	 1.00 1.00 1.00 0.50	Very limited Cutbanks cave Flooding Depth to saturated zone	 1.00 0.60 0.47	Somewhat limited Flooding	0.60
Holmquist, channeled-----	40	Very limited Flooding Depth to saturated zone Shrink-swell Frost action Low strength	 1.00 0.99 0.50 0.50 0.22	Very limited Depth to saturated zone Cutbanks cave Flooding	 1.00 1.00 0.80	Very limited Flooding Depth to saturated zone	1.00 0.99
Ld: LaDelle-----	90	Very limited Low strength Shrink-swell Frost action Flooding	 1.00 0.50 0.50 0.40	Somewhat limited Depth to saturated zone Cutbanks cave	 0.47 0.10	Not limited	
Le: LaDelle, channeled--	85	Very limited Frost action Flooding Low strength Shrink-swell	 1.00 1.00 1.00 0.50	Somewhat limited Flooding Depth to saturated zone Cutbanks cave	 0.80 0.47 0.10	Very limited Flooding	1.00
Lk: Lamo-----	90	Very limited Frost action Flooding Low strength Shrink-swell Depth to saturated zone	 1.00 1.00 1.00 0.50 0.19	Very limited Depth to saturated zone Flooding Cutbanks cave	 1.00 0.60 0.10	Somewhat limited Flooding Depth to saturated zone	0.60 0.19
Lm: Lamoure-----	85	Very limited Frost action Flooding Low strength Depth to saturated zone Shrink-swell	 1.00 1.00 1.00 0.99 0.50	Very limited Depth to saturated zone Flooding Cutbanks cave	 1.00 0.80 0.10	Very limited Flooding Depth to saturated zone	1.00 0.99

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ln: Lawet-----	85	Very limited Frost action Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.75 0.50	Very limited Depth to saturated zone Cutbanks cave Flooding	1.00 1.00 1.00 0.60	Somewhat limited Depth to saturated zone Flooding	0.75 0.60
Lo: Lawet, wet-----	90	Very limited Depth to saturated zone Frost action Flooding Ponding Shrink-swell	1.00 1.00 1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Cutbanks cave Ponding Flooding	1.00 1.00 1.00 1.00 0.60	Very limited Depth to saturated zone Ponding Flooding	1.00 1.00 0.60
Lp: Lawet-----	60	Very limited Frost action Flooding Depth to saturated zone Shrink-swell	1.00 1.00 0.75 0.50	Very limited Depth to saturated zone Cutbanks cave Flooding	1.00 1.00 1.00 0.60	Somewhat limited Depth to saturated zone Flooding	0.75 0.60
Davison-----	30	Very limited Frost action Shrink-swell	1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.99 0.10	Not limited	
LrA: Lehr-----	55	Not limited		Very limited Cutbanks cave	1.00	Somewhat limited Droughty	0.01
Bowdle-----	35	Not limited		Very limited Cutbanks cave	1.00	Not limited	
LrB: Lehr-----	60	Not limited		Very limited Cutbanks cave	1.00	Somewhat limited Droughty	0.01
Bowdle-----	30	Not limited		Very limited Cutbanks cave	1.00	Not limited	
Ls: Lowe-----	85	Very limited Depth to saturated zone Frost action Flooding Low strength Shrink-swell	1.00 1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Cutbanks cave Flooding	1.00 1.00 1.00 0.60	Very limited Depth to saturated zone Flooding	1.00 0.60

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Lt: Ludden-----	85	Very limited Depth to saturated zone Frost action Flooding Low strength Shrink-swell	1.00 1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Cutbanks cave Flooding Too clayey	1.00 1.00 0.80 0.50	Very limited Flooding Depth to saturated zone Too clayey	1.00 1.00 1.00
Lu: Ludden, ponded-----	90	Very limited Ponding Depth to saturated zone Frost action Flooding Low strength	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Cutbanks cave Flooding Too clayey	1.00 1.00 1.00 0.80 0.50	Very limited Ponding Flooding Depth to saturated zone Too clayey	1.00 1.00 1.00 1.00
Lw: Ludden, wet-----	85	Very limited Ponding Depth to saturated zone Frost action Flooding Low strength	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Cutbanks cave Flooding Too clayey	1.00 1.00 1.00 0.80 0.50	Very limited Ponding Flooding Depth to saturated zone Too clayey	1.00 1.00 1.00 1.00
M-W: Miscellaneous water-	100	Not rated		Not rated		Not rated	
MaC: Maddock-----	50	Somewhat limited Slope	0.01	Very limited Cutbanks cave Slope	1.00 0.01	Somewhat limited Slope	0.01
Egeland-----	35	Somewhat limited Frost action Slope	0.50 0.01	Very limited Cutbanks cave Slope	1.00 0.01	Somewhat limited Slope	0.01
MdA: Max-----	50	Somewhat limited Low strength Shrink-swell Frost action	0.78 0.50 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Arnegard-----	40	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
MdB: Max-----	60	Somewhat limited Low strength Shrink-swell Frost action	0.78 0.50 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MdB: (cont.)							
Arnegard-----	30	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Depth to	0.47		
		Shrink-swell	0.50	saturated zone			
		Frost action	0.50	Cutbanks cave	0.10		
MgB:							
Max-----	45	Somewhat limited		Somewhat limited		Not limited	
		Low strength	0.78	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Arnegard-----	30	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Depth to	0.47		
		Shrink-swell	0.50	saturated zone			
		Frost action	0.50	Cutbanks cave	0.10		
Zahl-----	20	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
MnB:							
Max-----	40	Somewhat limited		Somewhat limited		Not limited	
		Low strength	0.78	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Niobell-----	30	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Depth to	0.47		
		Shrink-swell	1.00	saturated zone			
		Frost action	0.50	Cutbanks cave	0.10		
Noonan-----	20	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Depth to	0.47		
		Shrink-swell	0.50	saturated zone			
		Frost action	0.50	Cutbanks cave	0.10		
MxC:							
Max-----	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Low strength	0.78	Cutbanks cave	0.10	Slope	0.01
		Shrink-swell	0.50	Slope	0.01		
		Frost action	0.50				
		Slope	0.01				
Zahl-----	30	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Cutbanks cave	0.10	Slope	0.01
		Shrink-swell	0.50	Slope	0.01		
		Frost action	0.50				
		Slope	0.01				
Arnegard-----	20	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Depth to	0.15		
		Shrink-swell	0.50	saturated zone			
		Frost action	0.50	Cutbanks cave	0.10		

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
My: Miranda-----	50	Very limited Low strength Shrink-swell Frost action	 1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	 0.99 0.10	Very limited Sodium content	 1.00
Heil-----	40	Very limited Depth to saturated zone Frost action Shrink-swell Low strength Ponding	 1.00 1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Cutbanks cave Ponding Too clayey	 1.00 1.00 1.00 0.72	Very limited Depth to saturated zone Sodium content Ponding	 1.00 1.00 1.00
Mz: Moritz-----	55	Very limited Frost action Low strength Shrink-swell Flooding Depth to saturated zone	 1.00 1.00 0.50 0.40 0.03	Very limited Depth to saturated zone Cutbanks cave	 1.00 1.00	Somewhat limited Depth to saturated zone	 0.03
Lowe-----	35	Very limited Depth to saturated zone Frost action Flooding Low strength Shrink-swell	 1.00 1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Cutbanks cave Flooding	 1.00 1.00 0.60	Very limited Depth to saturated zone Flooding	 1.00 0.60
Na: Nahon-----	45	Very limited Shrink-swell Low strength Frost action	 1.00 1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Too clayey	 1.00 0.47 0.12	Very limited Sodium content	 1.00
Aberdeen-----	30	Very limited Low strength Shrink-swell Frost action	 1.00 1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Too clayey	 1.00 0.47 0.12	Not limited	
Exline-----	20	Very limited Low strength Shrink-swell Frost action	 1.00 1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Too clayey	 1.00 0.99 0.12	Very limited Sodium content	 1.00
Nb: Nahon-----	45	Very limited Shrink-swell Low strength Frost action	 1.00 1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Too clayey	 1.00 0.47 0.12	Very limited Sodium content	 1.00

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Nb: (cont.) Aberdeen-----	30	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Too clayey	1.00 0.47 0.12	Not limited	
Exline-----	20	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Too clayey	1.00 0.99 0.12	Very limited Sodium content	1.00
Nc: Niobell-----	60	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
Noonan-----	30	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
Nd: Niobell-----	40	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
Noonan-----	30	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
Heil-----	20	Very limited Depth to saturated zone Frost action Shrink-swell Low strength Ponding	1.00 1.00 1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Cutbanks cave Ponding Too clayey	1.00 1.00 1.00 1.00 0.72	Very limited Depth to saturated zone Sodium content Ponding	1.00 1.00 1.00
NeA: Niobell-----	40	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
Noonan-----	30	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
Max-----	20	Somewhat limited Low strength Shrink-swell Frost action	0.78 0.50 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Nm:							
Noonan-----	55	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
Miranda-----	35	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Very limited Sodium content	1.00
Nr:							
Northville-----	60	Very limited Low strength Shrink-swell Frost action Flooding	1.00 0.50 0.50 0.40	Somewhat limited Depth to saturated zone Cutbanks cave Too clayey	0.61 0.10 0.03	Not limited	
Farmsworth-----	30	Very limited Low strength Shrink-swell Frost action Flooding Depth to saturated zone	1.00 1.00 0.50 0.40 0.03	Very limited Depth to saturated zone Cutbanks cave	1.00 0.10	Very limited Sodium content Depth to saturated zone	1.00 0.03
Nv:							
Northville-----	40	Very limited Low strength Shrink-swell Frost action Flooding	1.00 0.50 0.50 0.40	Somewhat limited Depth to saturated zone Cutbanks cave Too clayey	0.61 0.10 0.03	Not limited	
Farmsworth-----	30	Very limited Low strength Shrink-swell Frost action Flooding Depth to saturated zone	1.00 1.00 0.50 0.40 0.03	Very limited Depth to saturated zone Cutbanks cave	1.00 0.10	Very limited Sodium content Depth to saturated zone	1.00 0.03
Hoven-----	20	Very limited Depth to saturated zone Frost action Shrink-swell Low strength Ponding	1.00 1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Ponding Too clayey Cutbanks cave	1.00 1.00 0.28 0.10	Very limited Depth to saturated zone Sodium content Ponding	1.00 1.00 1.00
Ov:							
Overshue-----	90	Very limited Depth to saturated zone Frost action Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding Cutbanks cave	1.00 1.00 0.10	Very limited Depth to saturated zone Ponding	1.00 1.00

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Pa: Parnell-----	90	Very limited Ponding Depth to saturated zone Frost action Low strength Shrink-swell	1.00 1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Too clayey Cutbanks cave	1.00 1.00 0.28 0.10	Very limited Ponding Depth to saturated zone	1.00 1.00
Pc: Parshall-----	85	Somewhat limited Frost action	0.50	Very limited Cutbanks cave	1.00	Not limited	
PeA: Peever-----	85	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.15 0.10	Not limited	
PgB: Peever-----	60	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.15 0.10	Not limited	
Buse-----	30	Somewhat limited Low strength Shrink-swell Frost action	0.78 0.50 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
PoA: Peever-----	60	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.15 0.10	Not limited	
Cavour-----	30	Very limited Shrink-swell Low strength Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave Too clayey	0.47 0.10 0.03	Very limited Sodium content	1.00
Pp: Pits, gravel and sand-----	90	Very limited Slope	1.00	Very limited Cutbanks cave Slope	1.00 1.00	Very limited Slope Droughty Gravel content	1.00 0.42 0.25
Pr: Playmoor-----	85	Very limited Depth to saturated zone Frost action Flooding Low strength Shrink-swell	1.00 1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Cutbanks cave Flooding	1.00 1.00 0.80	Very limited Flooding Depth to saturated zone Salinity	1.00 1.00 1.00

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Py: Playmoor, channeled-	50	Very limited Depth to saturated zone Frost action Flooding Low strength Shrink-swell	1.00 1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Cutbanks cave Flooding	1.00 1.00 0.80	Very limited Flooding Depth to saturated zone Salinity	1.00 1.00 1.00
Lamoure, channeled--	40	Very limited Depth to saturated zone Frost action Flooding Low strength Shrink-swell	1.00 1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Flooding Cutbanks cave	1.00 0.80 0.10	Very limited Flooding Depth to saturated zone	1.00 1.00
Ra: Ranslo-----	85	Very limited Frost action Flooding Low strength Shrink-swell Depth to saturated zone	1.00 1.00 1.00 1.00 0.19	Very limited Depth to saturated zone Flooding Cutbanks cave	1.00 0.60 0.10	Very limited Sodium content Flooding Depth to saturated zone	1.00 0.60 0.19
Re: Ranslo-----	50	Very limited Frost action Flooding Low strength Shrink-swell Depth to saturated zone	1.00 1.00 1.00 1.00 0.19	Very limited Depth to saturated zone Flooding Cutbanks cave	1.00 0.60 0.10	Very limited Sodium content Flooding Depth to saturated zone	1.00 0.60 0.19
Harriet-----	40	Very limited Depth to saturated zone Frost action Flooding Low strength Shrink-swell	1.00 1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Flooding Cutbanks cave	1.00 0.60 0.10	Very limited Sodium content Depth to saturated zone Flooding	1.00 1.00 0.60
RfA: Renshaw-----	55	Not limited		Very limited Cutbanks cave	1.00	Somewhat limited Droughty	0.03
Fordville-----	35	Not limited		Very limited Cutbanks cave	1.00	Not limited	
RfB: Renshaw-----	60	Not limited		Very limited Cutbanks cave	1.00	Somewhat limited Droughty	0.03
Fordville-----	30	Not limited		Very limited Cutbanks cave	1.00	Not limited	

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
So: Southam-----	90	Very limited Ponding Depth to saturated zone Frost action Low strength Shrink-swell	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Cutbanks cave Too clayey	1.00 1.00 0.10 0.04	Very limited Ponding Depth to saturated zone Salinity	1.00 1.00 0.13
St: Stickney-----	60	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
Dudley-----	30	Very limited Shrink-swell Low strength Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Very limited Sodium content	1.00
Su: Stickney-----	40	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
Dudley-----	30	Very limited Shrink-swell Low strength Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Very limited Sodium content	1.00
Hoven-----	20	Very limited Depth to saturated zone Frost action Shrink-swell Low strength Ponding	1.00 1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Ponding Too clayey Cutbanks cave	1.00 1.00 0.28 0.10	Very limited Depth to saturated zone Sodium content Ponding	1.00 1.00 1.00
Sw: Straw, channeled----	85	Very limited Frost action Flooding	1.00 1.00	Somewhat limited Flooding Depth to saturated zone Cutbanks cave	0.80 0.47 0.10	Very limited Flooding	1.00
Sx: Straw-----	90	Somewhat limited Frost action Flooding	0.50 0.40	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
TbE: Talmo, stony-----	45	Very limited Slope	1.00	Very limited Cutbanks cave Slope	1.00 1.00	Very limited Slope Droughty	1.00 0.51

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TbE: (cont.) Ethan, stony-----	35	Very limited Slope Low strength Shrink-swell Frost action	1.00 1.00 0.50 0.50	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
Te: Tetonka-----	90	Very limited Depth to saturated zone Frost action Low strength Shrink-swell Ponding	1.00 1.00 1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Ponding Too clayey Cutbanks cave	1.00 1.00 0.28 0.10	Very limited Depth to saturated zone Ponding	1.00 1.00
Tk: Toko-----	90	Very limited Depth to saturated zone Frost action Ponding Shrink-swell	1.00 1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Ponding Cutbanks cave	1.00 1.00 0.10	Very limited Depth to saturated zone Ponding	1.00 1.00
Tm: Toko-----	90	Very limited Ponding Depth to saturated zone Frost action Shrink-swell	1.00 1.00 1.00 1.00 0.50	Very limited Ponding Depth to saturated zone Cutbanks cave	1.00 1.00 0.10	Very limited Ponding Depth to saturated zone	1.00 1.00
Tn: Tonka-----	90	Very limited Ponding Depth to saturated zone Frost action Low strength Shrink-swell	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Cutbanks cave	1.00 1.00 0.10	Very limited Ponding Depth to saturated zone	1.00 1.00
To: Tonka-----	60	Very limited Ponding Depth to saturated zone Frost action Low strength Shrink-swell	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Cutbanks cave	1.00 1.00 0.10	Very limited Ponding Depth to saturated zone	1.00 1.00
Rimlap-----	30	Very limited Frost action Low strength Shrink-swell Ponding Depth to saturated zone	1.00 1.00 1.00 1.00 0.78	Very limited Depth to saturated zone Ponding Too clayey Cutbanks cave	1.00 1.00 0.12 0.10	Very limited Ponding Depth to saturated zone	1.00 0.78

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Us: Udorthents, silty---	90	Somewhat limited Shrink-swell Frost action Low strength	0.50 0.50 0.22	Somewhat limited Cutbanks cave	0.10	Not limited	
Va: Vallars-----	60	Very limited Frost action Low strength Depth to saturated zone Shrink-swell	1.00 1.00 0.99 0.50	Very limited Depth to saturated zone Cutbanks cave	1.00 0.10	Somewhat limited Depth to saturated zone	0.99
Hamerly-----	30	Very limited Frost action Low strength Shrink-swell	1.00 0.78 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.99 0.10	Not limited	
VgA: Vang-----	85	Somewhat limited Frost action	0.50	Very limited Cutbanks cave	1.00	Not limited	
W: Water-----	100	Not rated		Not rated		Not rated	
WaA: Williams-----	50	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Bowbells-----	40	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
WaB: Williams-----	60	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Bowbells-----	30	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
WbA: Williams-----	45	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Bowbells-----	25	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WbA: (cont.) Tonka-----	20	Very limited Ponding Depth to saturated zone Frost action Low strength Shrink-swell	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Cutbanks cave	1.00 1.00 0.10	Very limited Ponding Depth to saturated zone	1.00 1.00
WbB: Williams-----	50	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Bowbells-----	25	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
Tonka-----	20	Very limited Ponding Depth to saturated zone Frost action Low strength Shrink-swell	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Cutbanks cave	1.00 1.00 0.10	Very limited Ponding Depth to saturated zone	1.00 1.00
WcA: Williams-----	55	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Niobell-----	30	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
WcB: Williams-----	60	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Niobell-----	30	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
WdA: Williams-----	45	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Niobell-----	25	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WdA: (cont.) Tonka-----	20	Very limited Ponding Depth to saturated zone Frost action Low strength Shrink-swell	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Cutbanks cave	1.00 1.00 0.10	Very limited Ponding Depth to saturated zone	1.00 1.00
WhD: Williams-----	50	Very limited Low strength Shrink-swell Frost action Slope	1.00 0.50 0.50 0.01	Somewhat limited Cutbanks cave Slope	0.10 0.01	Somewhat limited Slope	0.01
Vida-----	40	Somewhat limited Slope Shrink-swell Frost action Low strength	0.63 0.50 0.50 0.22	Somewhat limited Slope Cutbanks cave	0.63 0.10	Somewhat limited Slope Large stones content	0.63 0.01
WmB: Williams-----	50	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Zahl-----	25	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Bowbells-----	20	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.47 0.10	Not limited	
WmC: Williams-----	45	Very limited Low strength Shrink-swell Frost action Slope	1.00 0.50 0.50 0.01	Somewhat limited Cutbanks cave Slope	0.10 0.01	Somewhat limited Slope	0.01
Zahl-----	30	Very limited Low strength Shrink-swell Frost action Slope	1.00 0.50 0.50 0.01	Somewhat limited Cutbanks cave Slope	0.10 0.01	Somewhat limited Slope	0.01
Bowbells-----	20	Very limited Low strength Shrink-swell Frost action	1.00 0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.15 0.10	Not limited	

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Wn: Winship-----	60	Very limited Frost action Low strength	1.00 1.00	Somewhat limited Depth to saturated zone Cutbanks cave	0.99 0.10	Not limited	
Tonka-----	30	Very limited Ponding Depth to saturated zone Frost action Low strength Shrink-swell	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Cutbanks cave	1.00 1.00 0.10	Very limited Ponding Depth to saturated zone	1.00 1.00
Wo: Winship-----	60	Very limited Frost action Low strength Shrink-swell	1.00 1.00 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.99 0.10	Not limited	
Tonka-----	30	Very limited Ponding Depth to saturated zone Frost action Low strength Shrink-swell	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Cutbanks cave	1.00 1.00 0.10	Very limited Ponding Depth to saturated zone	1.00 1.00
Ws: Woonsocket-----	50	Somewhat limited Shrink-swell Frost action	0.50 0.50	Somewhat limited Depth to saturated zone Cutbanks cave	0.61 0.10	Not limited	
Whitelake-----	35	Somewhat limited Frost action	0.50	Very limited Cutbanks cave Depth to saturated zone	1.00 0.61	Not limited	
Wt: Worthing-----	90	Very limited Ponding Depth to saturated zone Frost action Low strength Shrink-swell	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Too clayey Cutbanks cave	1.00 1.00 0.50 0.10	Very limited Ponding Depth to saturated zone	1.00 1.00
Ww: Worthing, ponded----	90	Very limited Ponding Depth to saturated zone Frost action Low strength Shrink-swell	1.00 1.00 1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Too clayey Cutbanks cave	1.00 1.00 0.50 0.10	Very limited Ponding Depth to saturated zone	1.00 1.00

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ZaE: Zahill-----	85	Very limited Slope Low strength Shrink-swell Frost action	1.00 0.78 0.50 0.50	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope Large stones content	1.00 0.01
ZbC: Zahl-----	50	Very limited Low strength Shrink-swell Frost action Slope	1.00 0.50 0.50 0.50 0.01	Somewhat limited Cutbanks cave Slope	0.10 0.01	Somewhat limited Slope	0.01
Max-----	40	Somewhat limited Low strength Shrink-swell Frost action Slope	0.78 0.50 0.50 0.50 0.01	Somewhat limited Cutbanks cave Slope	0.10 0.01	Somewhat limited Slope	0.01
ZbD: Zahl-----	55	Very limited Slope Low strength Shrink-swell Frost action	1.00 1.00 0.50 0.50	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
Max-----	35	Somewhat limited Low strength Slope Shrink-swell Frost action	0.78 0.63 0.50 0.50	Somewhat limited Slope Cutbanks cave	0.63 0.10	Somewhat limited Slope	0.63
ZgD: Zell-----	55	Very limited Slope Low strength Frost action	1.00 1.00 0.50	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
Great Bend-----	35	Very limited Low strength Frost action Slope	1.00 0.50 0.50 0.01	Very limited Cutbanks cave Slope	1.00 0.01	Somewhat limited Slope	0.01

Sewage Disposal

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Aa:					
Aastad-----	85	Very limited Slow water movement Depth to saturated zone	1.00 0.99	Somewhat limited Depth to saturated zone Seepage	0.71 0.50
Ab:					
Aastad-----	50	Very limited Slow water movement Depth to saturated zone	1.00 0.99	Somewhat limited Depth to saturated zone Seepage	0.71 0.50
Hamerly-----	35	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 0.50
Ad:					
Aastad-----	60	Very limited Slow water movement Depth to saturated zone	1.00 0.99	Somewhat limited Depth to saturated zone Seepage	0.71 0.50
Tonka-----	30	Very limited Slow water movement Ponding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Seepage	1.00 1.00 0.50
Ae:					
Aberdeen-----	55	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone Seepage	0.40 0.18
Nahon-----	35	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
Ah:					
Aberdeen-----	55	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone Seepage	0.40 0.18

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Ah: (cont.) Nahon-----	35	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
An: Aberdeen-----	45	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone Seepage	0.40 0.18
Nahon-----	25	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
Heil-----	20	Very limited Slow water movement Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
Ao: Aberdeen-----	45	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone Seepage	0.40 0.18
Nahon-----	25	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
Heil-----	20	Very limited Slow water movement Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
At: Aquents, loamy-----	90	Very limited Ponding Depth to saturated zone Slow water movement	1.00 1.00 0.82	Very limited Ponding Depth to saturated zone Seepage	1.00 1.00 0.18
BaC: Beadle-----	80	Very limited Slow water movement Slope	1.00 0.01	Very limited Slope	1.00

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
BdA:					
Beadle-----	50	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Not limited	
Dudley-----	35	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
BeA:					
Beadle-----	60	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Not limited	
Stickney-----	30	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
BeB:					
Beadle-----	60	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Somewhat limited Slope	0.32
Stickney-----	30	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
BfA:					
Beadle, stony-----	60	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Not limited	
Stickney, stony-----	30	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
BfB:					
Beadle, stony-----	60	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Somewhat limited Slope	0.32

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
BfB: (cont.) Stickney, stony-----	30	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
Bg: Bearden-----	85	Very limited Depth to saturated zone Slow water movement	1.00 0.82	Very limited Depth to saturated zone Seepage	1.00 0.32
Bk: Bearden-----	60	Very limited Depth to saturated zone Slow water movement	1.00 0.82	Very limited Depth to saturated zone Seepage	1.00 0.32
Tonka-----	30	Very limited Slow water movement Ponding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Seepage	1.00 1.00 0.50
Bo: Beotia-----	90	Somewhat limited Slow water movement Depth to saturated zone	0.82 0.40	Somewhat limited Seepage	0.50
Br: Beotia-----	50	Somewhat limited Slow water movement Depth to saturated zone	0.82 0.40	Somewhat limited Seepage	0.50
Rondell-----	35	Somewhat limited Depth to saturated zone Slow water movement	0.94 0.82	Somewhat limited Seepage Depth to saturated zone	0.50 0.40
Bs: Beotia-----	60	Somewhat limited Depth to saturated zone Slow water movement	0.94 0.82	Somewhat limited Seepage Depth to saturated zone	0.50 0.40
Winship-----	30	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 0.50

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Bt:					
Beotia-----	60	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Seepage Depth to saturated zone	0.50 0.40
Winship-----	30	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 0.50
Bu:					
Bon-----	90	Very limited Seepage, bottom layer Depth to saturated zone Slow water movement Flooding	1.00 0.99 0.50 0.40	Very limited Seepage Depth to saturated zone Flooding	1.00 0.71 0.40
Bw:					
Bon, channeled-----	85	Very limited Flooding Seepage, bottom layer Depth to saturated zone Slow water movement	1.00 1.00 0.99 0.50	Very limited Flooding Seepage Depth to saturated zone	1.00 1.00 0.71
BxD:					
Buse-----	55	Very limited Slow water movement Slope	1.00 1.00	Very limited Slope	1.00
Barnes-----	35	Somewhat limited Slow water movement Slope	0.68 0.63	Very limited Slope Seepage	1.00 0.50
ByE:					
Buse, stony-----	50	Very limited Slow water movement Slope	1.00 1.00	Very limited Slope	1.00
Barnes, stony-----	35	Very limited Slow water movement Slope	1.00 1.00	Very limited Slope Seepage	1.00 0.50
BzE:					
Buse-----	50	Very limited Slope Slow water movement	1.00 1.00	Very limited Slope	1.00

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
BzE: (cont.) Langhei-----	40	Very limited Slope Slow water movement	1.00 1.00	Very limited Slope	1.00
Ca: Camtown-----	55	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Seepage Depth to saturated zone	0.50 0.40
Turton-----	30	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone Seepage	0.40 0.18
Cf: Cavour-----	55	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
Ferney-----	35	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
Co: Colvin, saline-----	85	Very limited Ponding Depth to saturated zone Slow water movement	1.00 1.00 0.82	Very limited Ponding Depth to saturated zone Seepage	1.00 1.00 0.18
Cr: Cresbard-----	60	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
Cavour-----	30	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
Cs: Cresbard-----	40	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Cs: (cont.)					
Cavour-----	30	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
Heil-----	20	Very limited Slow water movement Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
Ct:					
Crossplain-----	60	Very limited Flooding Depth to saturated zone Slow water movement	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 0.50
Tetonka-----	30	Very limited Slow water movement Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding Seepage	1.00 1.00 0.50
Da:					
Davis-----	55	Somewhat limited Depth to saturated zone Slow water movement Flooding	0.99 0.50 0.40	Somewhat limited Depth to saturated zone Seepage Flooding	0.71 0.50 0.40
Northville-----	35	Somewhat limited Depth to saturated zone Slow water movement Flooding	0.99 0.82 0.40	Somewhat limited Depth to saturated zone Flooding Seepage	0.71 0.40 0.18
Db:					
Davison-----	85	Very limited Depth to saturated zone Slow water movement	1.00 0.68	Very limited Depth to saturated zone Seepage	1.00 0.50
Dd:					
Davison-----	50	Very limited Depth to saturated zone Slow water movement	1.00 0.68	Very limited Depth to saturated zone Seepage	1.00 0.50

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Dd: (cont.) Tetonka-----	40	Very limited Slow water movement Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding Seepage	1.00 1.00 0.50
DeA: Delmont-----	55	Very limited Seepage, bottom layer Filtering capacity	1.00 1.00	Very limited Seepage	1.00
Enet-----	35	Very limited Seepage, bottom layer	1.00	Very limited Seepage	1.00
Dk: Dimo-----	85	Very limited Seepage, bottom layer Depth to saturated zone Slow water movement Flooding	1.00 0.99 0.50 0.40	Very limited Seepage Depth to saturated zone Flooding	1.00 0.71 0.40
Dm: Dimo-----	55	Very limited Depth to saturated zone Seepage, bottom layer Slow water movement Flooding	1.00 1.00 0.50 0.40	Very limited Seepage Depth to saturated zone Flooding	1.00 1.00 0.40
Grat-----	30	Very limited Slow water movement Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Seepage Depth to saturated zone Ponding	1.00 1.00 1.00
DoA: Doland-----	50	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Somewhat limited Seepage	0.50
Embden-----	30	Very limited Seepage, bottom layer Depth to saturated zone	1.00 0.99	Very limited Seepage Depth to saturated zone	1.00 0.71

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Dq: Dovecreek-----	90	Somewhat limited Depth to saturated zone Slow water movement Flooding	0.94 0.50 0.40	Somewhat limited Seepage Flooding	0.50 0.40
Dr: Dovray-----	90	Very limited Slow water movement Ponding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
Du: Dudley-----	55	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
Jerauld-----	35	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
Dx: Durrstein-----	85	Very limited Flooding Slow water movement Depth to saturated zone	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00
Ea: Eckman-----	85	Somewhat limited Slow water movement	0.50	Somewhat limited Seepage	0.50
EcA: Eckman-----	50	Somewhat limited Slow water movement	0.50	Somewhat limited Seepage	0.50
Gardena-----	40	Very limited Seepage, bottom layer Depth to saturated zone	1.00 0.99	Very limited Seepage Depth to saturated zone	1.00 0.71
EcB: Eckman-----	60	Somewhat limited Slow water movement	0.50	Somewhat limited Seepage Slope	0.50 0.32

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
EcB: (cont.) Gardena-----	30	Very limited Seepage, bottom layer Depth to saturated zone	1.00 0.99	Very limited Seepage Depth to saturated zone Slope	1.00 0.71 0.08
EdB: Eckman-----	60	Somewhat limited Slow water movement	0.50	Somewhat limited Seepage Slope	0.50 0.32
Zell-----	30	Somewhat limited Slow water movement	0.82	Somewhat limited Seepage Slope	0.50 0.32
EeB: Edgeley-----	85	Very limited Depth to bedrock Slow water movement	1.00 0.50	Very limited Depth to soft bedrock Seepage Slope	1.00 0.50 0.32
EeC: Edgeley-----	85	Very limited Depth to bedrock Slow water movement Slope	1.00 0.50 0.01	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 0.50
EeD: Edgeley-----	85	Very limited Depth to bedrock Slope Slow water movement	1.00 1.00 0.50	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 0.50
EgA: Egeland-----	50	Somewhat limited Slow water movement	0.50	Very limited Seepage	1.00
Embden-----	40	Very limited Seepage, bottom layer Depth to saturated zone	1.00 0.99	Very limited Seepage Depth to saturated zone	1.00 0.71
EgB: Egeland-----	50	Somewhat limited Slow water movement	0.50	Very limited Seepage Slope	1.00 0.32
Embden-----	35	Very limited Seepage, bottom layer Depth to saturated zone	1.00 0.99	Very limited Seepage Depth to saturated zone Slope	1.00 0.71 0.32

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Ek: Elsmere-----	85	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Seepage Depth to saturated zone	1.00 1.00
EmE: Ethan-----	50	Very limited Slope Slow water movement	1.00 0.68	Very limited Slope Seepage	1.00 0.50
Betts-----	40	Very limited Slope Slow water movement	1.00 1.00	Very limited Slope Seepage	1.00 0.50
EnD: Ethan-----	55	Very limited Slope Slow water movement	1.00 0.68	Very limited Slope Seepage	1.00 0.50
Hand-----	35	Somewhat limited Slope Slow water movement	0.63 0.50	Very limited Slope Seepage	1.00 0.50
Er: Exline-----	50	Very limited Slow water movement Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone	1.00
Aberdeen-----	25	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone Seepage	0.40 0.18
Nahon-----	20	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
Et: Exline-----	50	Very limited Slow water movement Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone	1.00
Aberdeen-----	25	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone Seepage	0.40 0.18

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Et: (cont.) Nahon-----	20	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
Ew: Exline-----	50	Very limited Slow water movement Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone	1.00
Heil-----	40	Very limited Slow water movement	1.00	Very limited Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00		
Ex: Exline-----	50	Very limited Slow water movement Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone	1.00
Heil-----	40	Very limited Slow water movement	1.00	Very limited Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00		
EyA: Exline-----	45	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
Putney-----	40	Somewhat limited Slow water movement	0.82	Somewhat limited Seepage	0.50
		Depth to saturated zone	0.40	Slope	0.08
Fa: Farmsworth-----	50	Very limited Slow water movement Depth to saturated zone Flooding	1.00 1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Fa: (cont.) Durrstein-----	35	Very limited Flooding Slow water movement Depth to saturated zone	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00
Fe: Ferney-----	50	Very limited Slow water movement Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone	1.00
Heil-----	40	Very limited Slow water movement Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
Ff: Forestburg-----	60	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Seepage Depth to saturated zone	1.00 1.00
Elsmere-----	30	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Seepage Depth to saturated zone	1.00 1.00
Fh: Forestburg-----	45	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Seepage Depth to saturated zone	1.00 1.00
Elsmere-----	25	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Seepage Depth to saturated zone	1.00 1.00
Toko-----	20	Very limited Depth to saturated zone Slow water movement Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Seepage Ponding	1.00 1.00 1.00

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
FmA:					
Forman-----	50	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Somewhat limited Seepage	0.50
Aastad-----	40	Very limited Slow water movement Depth to saturated zone	1.00 0.99	Somewhat limited Depth to saturated zone Seepage	0.71 0.50
FmB:					
Forman-----	60	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Somewhat limited Slope Seepage	0.68 0.50
Aastad-----	30	Very limited Slow water movement Depth to saturated zone	1.00 0.99	Somewhat limited Depth to saturated zone Seepage	0.71 0.50
FnC:					
Forman-----	55	Very limited Slow water movement Slope	1.00 0.01	Very limited Slope Seepage	1.00 0.50
Buse-----	35	Very limited Slow water movement Slope	1.00 0.01	Very limited Slope	1.00
FrB:					
Forman-----	50	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Somewhat limited Seepage Slope	0.50 0.32
Buse-----	25	Very limited Slow water movement	1.00	Somewhat limited Slope	0.68
Aastad-----	20	Very limited Slow water movement Depth to saturated zone	1.00 0.99	Somewhat limited Depth to saturated zone Seepage	0.71 0.50
FrC:					
Forman-----	45	Very limited Slow water movement Slope	1.00 0.01	Very limited Slope Seepage	1.00 0.50

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
FrC: (cont.)					
Buse-----	30	Very limited Slow water movement Slope	1.00 0.01	Very limited Slope	1.00
Aastad-----	20	Very limited Slow water movement Depth to saturated zone	1.00 0.99	Somewhat limited Depth to saturated zone Seepage Slope	0.71 0.50 0.32
FsA:					
Forman-----	55	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Somewhat limited Seepage	0.50
Cresbard-----	30	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
FsB:					
Forman-----	60	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Somewhat limited Seepage Slope	0.50 0.32
Cresbard-----	30	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone Slope	0.40 0.32
FtA:					
Forman-----	45	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Somewhat limited Seepage	0.50
Cresbard-----	25	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
Tonka-----	20	Very limited Slow water movement Ponding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Seepage	1.00 1.00 0.50

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Ga: Gardena-----	90	Very limited Seepage, bottom layer Depth to saturated zone	1.00 0.99	Very limited Seepage Depth to saturated zone	1.00 0.71
Gd: Gardena-----	55	Very limited Seepage, bottom layer Depth to saturated zone	1.00 0.99	Very limited Seepage Depth to saturated zone	1.00 0.71
Glyndon-----	35	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Ge: Gardena-----	50	Very limited Seepage, bottom layer Depth to saturated zone	1.00 0.99	Very limited Seepage Depth to saturated zone	1.00 0.71
Turton-----	35	Very limited Slow water movement	1.00	Somewhat limited Depth to saturated zone	0.40
		Depth to saturated zone	0.94	Seepage	0.18
GgA: Great Bend-----	90	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Somewhat limited Seepage	0.50
GnA: Great Bend-----	50	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Somewhat limited Seepage	0.50
Beotia-----	40	Somewhat limited Slow water movement	0.82	Somewhat limited Seepage	0.50
		Depth to saturated zone	0.40		
GnB: Great Bend-----	60	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Somewhat limited Seepage Slope	0.50 0.32

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
GnB: (cont.) Beotia-----	30	Somewhat limited Slow water movement Depth to saturated zone	0.82 0.40	Somewhat limited Seepage	0.50
GoA: Great Bend-----	50	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Somewhat limited Seepage	0.50
Beotia-----	40	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Somewhat limited Seepage	0.50
GpA: Great Bend-----	50	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Somewhat limited Seepage	0.50
Putney-----	35	Somewhat limited Slow water movement Depth to saturated zone	0.82 0.40	Somewhat limited Seepage	0.50
GpB: Great Bend-----	50	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Somewhat limited Seepage Slope	0.50 0.08
Putney-----	35	Somewhat limited Slow water movement Depth to saturated zone	0.82 0.40	Somewhat limited Seepage Slope	0.50 0.08
GtB: Great Bend-----	60	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Somewhat limited Seepage Slope	0.50 0.32
Zell-----	30	Somewhat limited Slow water movement	0.82	Somewhat limited Seepage Slope	0.50 0.32

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
GtC:					
Great Bend-----	50	Very limited Slow water movement Slope	1.00 0.01	Very limited Slope Seepage	1.00 0.50
Zell-----	40	Somewhat limited Slow water movement Slope	0.82 0.01	Very limited Slope Seepage	1.00 0.50
GzC:					
Great Bend-----	45	Very limited Slow water movement	1.00	Very limited Slope Seepage	1.00 0.50
Zell-----	25	Somewhat limited Slow water movement Slope	0.82 0.01	Very limited Slope Seepage	1.00 0.50
Huffton-----	20	Somewhat limited Slow water movement Slope	0.82 0.01	Very limited Slope Seepage	1.00 0.50
HaA:					
Hamerly-----	85	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 0.50
Hb:					
Hamerly-----	50	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 0.50
Tonka-----	40	Very limited Slow water movement Ponding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Seepage	1.00 1.00 0.50
HcA:					
Hand-----	50	Somewhat limited Slow water movement Depth to saturated zone	0.50 0.40	Somewhat limited Seepage	0.50
Bonilla-----	40	Somewhat limited Depth to saturated zone Slow water movement	0.94 0.68	Somewhat limited Seepage Depth to saturated zone	0.50 0.40

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
HcB:					
Hand-----	60	Somewhat limited Slow water movement Depth to saturated zone	0.50 0.40	Somewhat limited Seepage Slope	0.50 0.32
Bonilla-----	30	Somewhat limited Depth to saturated zone Slow water movement	0.94 0.68	Somewhat limited Seepage Depth to saturated zone	0.50 0.40
HdA:					
Hand-----	50	Somewhat limited Slow water movement Depth to saturated zone	0.50 0.40	Somewhat limited Seepage	0.50
Carthage-----	40	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Seepage Depth to saturated zone	1.00 0.99
He:					
Hand-----	45	Somewhat limited Slow water movement Depth to saturated zone	0.50 0.40	Somewhat limited Seepage	0.50
Carthage-----	25	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Seepage Depth to saturated zone	1.00 0.99
Overshue-----	20	Very limited Depth to saturated zone Slow water movement Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Seepage Ponding	1.00 1.00 1.00
HfC:					
Hand-----	55	Somewhat limited Slow water movement Slope	0.50 0.01	Very limited Slope Seepage	1.00 0.50
Ethan-----	35	Somewhat limited Slow water movement Slope	0.68 0.01	Very limited Slope Seepage	1.00 0.50

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
HgB: Hand-----	50	Somewhat limited Slow water movement Depth to saturated zone	0.50 0.40	Somewhat limited Seepage Slope	0.50 0.32
Ethan-----	25	Somewhat limited Slow water movement	0.68	Somewhat limited Seepage Slope	0.50 0.32
Bonilla-----	20	Somewhat limited Depth to saturated zone Slow water movement	0.94 0.68	Somewhat limited Seepage Depth to saturated zone	0.50 0.40
HgC: Hand-----	45	Somewhat limited Slow water movement Slope	0.50 0.01	Very limited Slope Seepage	1.00 0.50
Ethan-----	30	Somewhat limited Slow water movement Slope	0.68 0.01	Very limited Slope Seepage	1.00 0.50
Bonilla-----	20	Somewhat limited Depth to saturated zone Slow water movement	0.94 0.68	Somewhat limited Seepage Depth to saturated zone Slope	0.50 0.40 0.32
HhB: Hand-----	50	Somewhat limited Slow water movement Depth to saturated zone	0.50 0.40	Somewhat limited Seepage Slope	0.50 0.32
Ethan-----	25	Somewhat limited Slow water movement	0.68	Somewhat limited Seepage Slope	0.50 0.32
Carthage-----	20	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Seepage Depth to saturated zone	1.00 0.99
HjB: Hand-----	45	Somewhat limited Slow water movement Depth to saturated zone	0.50 0.40	Somewhat limited Seepage Slope	0.50 0.32

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
HjB: (cont.)					
Talmo-----	35	Very limited Seepage, bottom layer Filtering capacity	1.00 1.00	Very limited Seepage Slope	1.00 0.32
HjC:					
Hand-----	45	Somewhat limited Slow water movement Slope	0.50 0.01	Very limited Slope Seepage	1.00 0.50
Talmo-----	35	Very limited Seepage, bottom layer Filtering capacity Slope	1.00 1.00 0.01	Very limited Seepage Slope	1.00 1.00
Hk:					
Harmony-----	55	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone Seepage	0.40 0.18
Aberdeen-----	35	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone Seepage	0.40 0.18
Hm:					
Harmony-----	55	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone Seepage	0.40 0.18
Aberdeen-----	35	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone Seepage	0.40 0.18
Hn:					
Harmony-----	55	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone Seepage	0.40 0.18
Beotia-----	35	Somewhat limited Slow water movement Depth to saturated zone	0.82 0.40	Somewhat limited Seepage	0.50

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Ho: Harmony-----	55	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone Seepage	0.40 0.18
Beotia-----	35	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Somewhat limited Seepage	0.50
Hp: Harriet-----	90	Very limited Flooding Slow water movement Depth to saturated zone	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 0.50
Hr: Heil-----	90	Very limited Slow water movement Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
HsA: Henkin-----	55	Very limited Seepage, bottom layer	1.00	Very limited Seepage	1.00
Blendon-----	35	Very limited Seepage, bottom layer Depth to saturated zone	1.00 0.40	Very limited Seepage	1.00
HsB: Henkin-----	60	Very limited Seepage, bottom layer	1.00	Very limited Seepage Slope	1.00 0.32
Blendon-----	30	Very limited Seepage, bottom layer Depth to saturated zone	1.00 0.40	Very limited Seepage Slope	1.00 0.32
HtB: Houdek-----	50	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Somewhat limited Seepage Slope	0.50 0.32

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
HtB: (cont.)					
Ethan-----	25	Somewhat limited Slow water movement	0.68	Somewhat limited Seepage Slope	0.50 0.32
Prosper-----	20	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Seepage Depth to saturated zone	0.50 0.40
HtC:					
Houdek-----	45	Very limited Slow water movement Slope	1.00 0.01	Very limited Slope Seepage	1.00 0.50
Ethan-----	30	Somewhat limited Slow water movement Slope	0.68 0.01	Very limited Slope Seepage	1.00 0.50
Prosper-----	20	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Seepage Depth to saturated zone Slope	0.50 0.40 0.32
HuA:					
Houdek-----	50	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Somewhat limited Seepage	0.50
Prosper-----	40	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Seepage Depth to saturated zone	0.50 0.40
HuB:					
Houdek-----	60	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Somewhat limited Seepage Slope	0.50 0.32
Prosper-----	30	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Seepage Depth to saturated zone	0.50 0.40
HwA:					
Houdek-----	55	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Somewhat limited Seepage	0.50

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
HwA: (cont.) Stickney-----	35	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
HxA: Houdek-----	45	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Somewhat limited Seepage	0.50
Stickney-----	25	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
Tetonka-----	20	Very limited Slow water movement Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding Seepage	1.00 1.00 0.50
Hy: Hoven-----	90	Very limited Slow water movement Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
Ie: Ipage-----	45	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Very limited Seepage Depth to saturated zone Slope	1.00 0.40 0.32
Els-----	25	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Seepage Depth to saturated zone	1.00 1.00
Shue-----	20	Very limited Depth to saturated zone Slow water movement Ponding	1.00 1.00 1.00	Very limited Seepage Depth to saturated zone Ponding	1.00 1.00 1.00

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Jh:					
Jerauld-----	50	Very limited Slow water movement Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone	1.00
Hoven-----	40	Very limited Slow water movement Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
KaA:					
Kranzburg-----	50	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Somewhat limited Seepage	0.50
Brookings-----	40	Somewhat limited Depth to saturated zone Slow water movement	0.99 0.68	Somewhat limited Depth to saturated zone Seepage	0.71 0.50
KbB:					
Kranzburg-----	40	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Somewhat limited Seepage Slope	0.50 0.32
Brookings-----	30	Somewhat limited Depth to saturated zone Slow water movement	0.99 0.68	Somewhat limited Depth to saturated zone Seepage	0.71 0.50
Buse-----	25	Very limited Slow water movement	1.00	Somewhat limited Slope	0.68
KcA:					
Kranzburg-----	55	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Somewhat limited Seepage	0.50
Cresbard-----	30	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
KtA: Kranzburg-----	45	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Somewhat limited Seepage	0.50
Cresbard-----	25	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
Tonka-----	20	Very limited Slow water movement Ponding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Seepage	1.00 1.00 0.50
KzB: Kranzburg-----	40	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Somewhat limited Seepage Slope	0.50 0.32
Zell-----	30	Somewhat limited Slow water movement	0.82	Somewhat limited Seepage Slope	0.50 0.32
Aastad-----	20	Very limited Slow water movement Depth to saturated zone	1.00 0.99	Somewhat limited Depth to saturated zone Seepage	0.71 0.50
La: La Prairie-----	85	Somewhat limited Depth to saturated zone Slow water movement Flooding	0.94 0.50 0.40	Somewhat limited Seepage Flooding Depth to saturated zone	0.50 0.40 0.40
Lc: La Prairie, channeled-----	50	Very limited Flooding Depth to saturated zone Slow water movement	1.00 0.94 0.50	Very limited Flooding Seepage Depth to saturated zone	1.00 0.50 0.40
Holmquist, channeled-----	40	Very limited Flooding Depth to saturated zone Slow water movement	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 0.50

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Ld: LaDelle-----	90	Somewhat limited Depth to saturated zone Slow water movement Flooding	0.94 0.50 0.40	Somewhat limited Seepage Flooding Depth to saturated zone	0.50 0.40 0.40
Le: LaDelle, channeled--	85	Very limited Flooding Depth to saturated zone Slow water movement	1.00 0.94 0.50	Very limited Flooding Seepage Depth to saturated zone	1.00 0.50 0.40
Lk: Lamo-----	90	Very limited Flooding Depth to saturated zone Slow water movement	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 0.32
Lm: Lamoure-----	85	Very limited Flooding Depth to saturated zone Slow water movement	1.00 1.00 0.68	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 0.32
Ln: Lawet-----	85	Very limited Flooding Depth to saturated zone Seepage, bottom layer Slow water movement	1.00 1.00 1.00 0.68	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 1.00
Lo: Lawet, wet-----	90	Very limited Flooding Depth to saturated zone Seepage, bottom layer Ponding Slow water movement	1.00 1.00 1.00 1.00 0.68	Very limited Flooding Depth to saturated zone Seepage Ponding	1.00 1.00 1.00 1.00

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Lp: Lawet-----	60	Very limited Flooding Depth to saturated zone Seepage, bottom layer Slow water movement	1.00 1.00 1.00 0.68	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 1.00
Davison-----	30	Very limited Depth to saturated zone Slow water movement	1.00 0.68	Very limited Depth to saturated zone Seepage	1.00 0.50
LrA: Lehr-----	55	Very limited Seepage, bottom layer Filtering capacity	1.00 1.00	Very limited Seepage	1.00
Bowdle-----	35	Very limited Seepage, bottom layer Slow water movement	1.00 0.50	Very limited Seepage	1.00
LrB: Lehr-----	60	Very limited Seepage, bottom layer Filtering capacity	1.00 1.00	Very limited Seepage Slope	1.00 0.68
Bowdle-----	30	Very limited Seepage, bottom layer Slow water movement	1.00 0.50	Very limited Seepage Slope	1.00 0.32
Ls: Lowe-----	85	Very limited Flooding Depth to saturated zone Slow water movement	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 0.50
Lt: Ludden-----	85	Very limited Flooding Slow water movement Depth to saturated zone	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Lu:					
Ludden, ponded-----	90	Very limited Flooding Slow water movement Ponding Depth to saturated zone	1.00 1.00 1.00 1.00	Very limited Ponding Flooding Depth to saturated zone	1.00 1.00 1.00
Lw:					
Ludden, wet-----	85	Very limited Flooding Slow water movement Ponding Depth to saturated zone	1.00 1.00 1.00 1.00	Very limited Ponding Flooding Depth to saturated zone	1.00 1.00 1.00
M-W:					
Miscellaneous water-	100	Not rated		Not rated	
MaC:					
Maddock-----	50	Very limited Seepage, bottom layer Filtering capacity Slope	1.00 1.00 0.01	Very limited Seepage Slope	1.00 1.00
Egeland-----	35	Somewhat limited Slow water movement Slope	0.50 0.01	Very limited Seepage Slope	1.00 1.00
MdA:					
Max-----	50	Very limited Slow water movement	1.00	Somewhat limited Seepage	0.50
Arnegard-----	40	Somewhat limited Depth to saturated zone Slow water movement	0.94 0.50	Somewhat limited Seepage Depth to saturated zone	0.50 0.40
MdB:					
Max-----	60	Very limited Slow water movement	1.00	Somewhat limited Slope Seepage	0.68 0.50
Arnegard-----	30	Somewhat limited Depth to saturated zone Slow water movement	0.94 0.50	Somewhat limited Seepage Depth to saturated zone	0.50 0.40
MgB:					
Max-----	45	Very limited Slow water movement	1.00	Somewhat limited Slope Seepage	0.68 0.50

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
MgB: (cont.)					
Arnegard-----	30	Somewhat limited Depth to saturated zone	0.94	Somewhat limited Seepage	0.50
		Slow water movement	0.50	Depth to saturated zone	0.40
Zahl-----	20	Very limited Slow water movement	1.00	Somewhat limited Slope	0.68
				Seepage	0.50
MnB:					
Max-----	40	Very limited Slow water movement	1.00	Somewhat limited Slope	0.68
				Seepage	0.50
Niobell-----	30	Very limited Slow water movement	1.00	Somewhat limited Depth to	0.40
		Depth to saturated zone	0.94	saturated zone	0.32
Noonan-----	20	Very limited Slow water movement	1.00	Somewhat limited Depth to	0.40
		Depth to saturated zone	0.94	saturated zone	0.32
MxC:					
Max-----	45	Very limited Slow water movement	1.00	Very limited Slope	1.00
		Slope	0.01	Seepage	0.50
Zahl-----	30	Very limited Slow water movement	1.00	Very limited Slope	1.00
		Slope	0.01	Seepage	0.50
Arnegard-----	20	Somewhat limited Slow water movement	0.50	Somewhat limited Seepage	0.50
		Depth to saturated zone	0.40	Slope	0.32
My:					
Miranda-----	50	Very limited Slow water movement	1.00	Very limited Depth to	1.00
		Depth to saturated zone	1.00	saturated zone	
Heil-----	40	Very limited Slow water movement	1.00	Very limited Depth to	1.00
		Depth to saturated zone	1.00	saturated zone	1.00
		Ponding	1.00	Ponding	1.00

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Mz:					
Moritz-----	55	Very limited Depth to saturated zone Slow water movement Flooding	1.00 0.50 0.40	Very limited Depth to saturated zone Seepage Flooding	1.00 0.50 0.40
Lowe-----	35	Very limited Flooding Depth to saturated zone Slow water movement	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 0.50
Na:					
Nahon-----	45	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
Aberdeen-----	30	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone Seepage	0.40 0.18
Exline-----	20	Very limited Slow water movement Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone	1.00
Nb:					
Nahon-----	45	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
Aberdeen-----	30	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone Seepage	0.40 0.18
Exline-----	20	Very limited Slow water movement Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone	1.00
Nc:					
Niobell-----	60	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Nc: (cont.) Noonan-----	30	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
Nd: Niobell-----	40	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
Noonan-----	30	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
Heil-----	20	Very limited Slow water movement Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
NeA: Niobell-----	40	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
Noonan-----	30	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
Max-----	20	Very limited Slow water movement	1.00	Somewhat limited Seepage Slope	0.50 0.08
Nm: Noonan-----	55	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
Miranda-----	35	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Nr:					
Northville-----	60	Somewhat limited		Somewhat limited	
		Depth to	0.99	Depth to	0.71
		saturated zone		saturated zone	
		Slow water	0.82	Flooding	0.40
		movement		Seepage	0.18
		Flooding	0.40		
Farmsworth-----	30	Very limited		Very limited	
		Slow water	1.00	Depth to	1.00
		movement		saturated zone	
		Depth to	1.00	Flooding	0.40
		saturated zone			
		Flooding	0.40		
Nv:					
Northville-----	40	Somewhat limited		Somewhat limited	
		Depth to	0.99	Depth to	0.71
		saturated zone		saturated zone	
		Slow water	0.82	Flooding	0.40
		movement		Seepage	0.18
		Flooding	0.40		
Farmsworth-----	30	Very limited		Very limited	
		Slow water	1.00	Depth to	1.00
		movement		saturated zone	
		Depth to	1.00	Flooding	0.40
		saturated zone			
		Flooding	0.40		
Hoven-----	20	Very limited		Very limited	
		Slow water	1.00	Depth to	1.00
		movement		saturated zone	
		Depth to	1.00	Ponding	1.00
		saturated zone			
		Ponding	1.00		
Ov:					
Overshue-----	90	Very limited		Very limited	
		Depth to	1.00	Depth to	1.00
		saturated zone		saturated zone	
		Slow water	1.00	Seepage	1.00
		movement		Ponding	1.00
		Ponding	1.00		
Pa:					
Parnell-----	90	Very limited		Very limited	
		Slow water	1.00	Ponding	1.00
		movement		Depth to	1.00
		Ponding	1.00	saturated zone	
		Depth to	1.00		
		saturated zone			
Pc:					
Parshall-----	85	Very limited		Very limited	
		Seepage, bottom	1.00	Seepage	1.00
		layer			

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
PeA: Peever-----	85	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Not limited	
PgB: Peever-----	60	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Somewhat limited Slope	0.08
Buse-----	30	Very limited Slow water movement	1.00	Somewhat limited Slope	0.32
PoA: Peever-----	60	Very limited Slow water movement Depth to saturated zone	1.00 0.40	Not limited	
Cavour-----	30	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
Pp: Pits, gravel and sand-----	90	Very limited Seepage, bottom layer Filtering capacity Slope	1.00 1.00 1.00	Very limited Seepage Slope	1.00 1.00
Pr: Playmoor-----	85	Very limited Flooding Depth to saturated zone Slow water movement	1.00 1.00 0.68	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 0.32
Py: Playmoor, channeled-	50	Very limited Flooding Depth to saturated zone Slow water movement	1.00 1.00 0.68	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 0.32

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Py: (cont.) Lamoure, channeled--	40	Very limited Flooding Depth to saturated zone Slow water movement	1.00 1.00 0.68	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 0.32
Ra: Ranslo-----	85	Very limited Flooding Slow water movement Depth to saturated zone	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00
Re: Ranslo-----	50	Very limited Flooding Slow water movement Depth to saturated zone	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00
Harriet-----	40	Very limited Flooding Slow water movement Depth to saturated zone	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 0.50
RfA: Renshaw-----	55	Very limited Seepage, bottom layer Filtering capacity	1.00 1.00	Very limited Seepage	1.00
Fordville-----	35	Very limited Seepage, bottom layer	1.00	Very limited Seepage	1.00
RfB: Renshaw-----	60	Very limited Seepage, bottom layer Filtering capacity	1.00 1.00	Very limited Seepage Slope	1.00 0.32
Fordville-----	30	Very limited Seepage, bottom layer	1.00	Very limited Seepage Slope	1.00 0.32
So: Southam-----	90	Very limited Slow water movement Ponding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
St: Stickney-----	60	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
Dudley-----	30	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
Su: Stickney-----	40	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
Dudley-----	30	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Depth to saturated zone	0.40
Hoven-----	20	Very limited Slow water movement Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
Sw: Straw, channeled----	85	Very limited Flooding Seepage, bottom layer Depth to saturated zone Slow water movement	1.00 1.00 0.94 0.50	Very limited Flooding Seepage Depth to saturated zone	1.00 1.00 0.40
Sx: Straw-----	90	Very limited Seepage, bottom layer Depth to saturated zone Slow water movement Flooding	1.00 0.94 0.50 0.40	Very limited Seepage Flooding Depth to saturated zone	1.00 1.00 0.40
TbE: Talmo, stony-----	45	Very limited Seepage, bottom layer Slope Filtering capacity	1.00 1.00 1.00	Very limited Slope Seepage	1.00 1.00

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
TbE: (cont.) Ethan, stony-----	35	Very limited Slope Slow water movement	1.00 0.68	Very limited Slope Seepage	1.00 0.50
Te: Tetonka-----	90	Very limited Slow water movement Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding Seepage	1.00 1.00 0.50
Tk: Toko-----	90	Very limited Depth to saturated zone Slow water movement Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Seepage Ponding	1.00 1.00 1.00
Tm: Toko-----	90	Very limited Ponding Depth to saturated zone Slow water movement	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Seepage	1.00 1.00 1.00
Tn: Tonka-----	90	Very limited Slow water movement Ponding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Seepage	1.00 1.00 0.50
To: Tonka-----	60	Very limited Slow water movement Ponding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Seepage	1.00 1.00 0.50
Rimlap-----	30	Very limited Slow water movement Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
Us: Udorthents, silty---	90	Very limited Slow water movement	1.00	Not limited	

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Va: Vallers-----	60	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Depth to saturated zone	1.00
Hamerly-----	30	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 0.50
VgA: Vang-----	85	Very limited Seepage, bottom layer Slow water movement	1.00 0.50	Very limited Seepage	1.00
W: Water-----	100	Not rated		Not rated	
WaA: Williams-----	50	Very limited Slow water movement	1.00	Somewhat limited Seepage	0.50
Bowbells-----	40	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Seepage Depth to saturated zone	0.50 0.40
WaB: Williams-----	60	Very limited Slow water movement	1.00	Somewhat limited Slope Seepage	0.68 0.50
Bowbells-----	30	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Seepage Depth to saturated zone	0.50 0.40
WbA: Williams-----	45	Very limited Slow water movement	1.00	Somewhat limited Seepage	0.50
Bowbells-----	25	Very limited Slow water movement Depth to saturated zone	1.00 0.94	Somewhat limited Seepage Depth to saturated zone	0.50 0.40

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
WbA: (cont.)					
Tonka-----	20	Very limited Slow water movement	1.00	Very limited Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Seepage	0.50
WbB:					
Williams-----	50	Very limited Slow water movement	1.00	Somewhat limited Slope	0.68
				Seepage	0.50
Bowbells-----	25	Very limited Slow water movement	1.00	Somewhat limited Seepage	0.50
		Depth to saturated zone	0.94	Depth to saturated zone	0.40
Tonka-----	20	Very limited Slow water movement	1.00	Very limited Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Seepage	0.50
WcA:					
Williams-----	55	Very limited Slow water movement	1.00	Somewhat limited Seepage	0.50
Niobell-----	30	Very limited Slow water movement	1.00	Somewhat limited Depth to saturated zone	0.40
		Depth to saturated zone	0.94		
WcB:					
Williams-----	60	Very limited Slow water movement	1.00	Somewhat limited Slope	0.68
				Seepage	0.50
Niobell-----	30	Very limited Slow water movement	1.00	Somewhat limited Depth to saturated zone	0.40
		Depth to saturated zone	0.94	Slope	0.32
WdA:					
Williams-----	45	Very limited Slow water movement	1.00	Somewhat limited Seepage	0.50
Niobell-----	25	Very limited Slow water movement	1.00	Somewhat limited Depth to saturated zone	0.40
		Depth to saturated zone	0.94		

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
WdA: (cont.)					
Tonka-----	20	Very limited Slow water movement	1.00	Very limited Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Seepage	0.50
WhD:					
Williams-----	50	Very limited Slow water movement	1.00	Very limited Slope	1.00
		Slope	0.01	Seepage	1.00
Vida-----	40	Very limited Slow water movement	1.00	Very limited Slope	1.00
		Slope	0.63		
WmB:					
Williams-----	50	Very limited Slow water movement	1.00	Somewhat limited Slope	0.68
				Seepage	0.50
Zahl-----	25	Very limited Slow water movement	1.00	Somewhat limited Slope	0.68
				Seepage	0.50
Bowbells-----	20	Very limited Slow water movement	1.00	Somewhat limited Seepage	0.50
		Depth to saturated zone	0.94	Depth to saturated zone	0.40
WmC:					
Williams-----	45	Very limited Slow water movement	1.00	Very limited Slope	1.00
		Slope	0.01	Seepage	0.50
Zahl-----	30	Very limited Slow water movement	1.00	Very limited Slope	1.00
		Slope	0.01	Seepage	0.50
Bowbells-----	20	Very limited Slow water movement	1.00	Somewhat limited Slope	0.68
		Depth to saturated zone	0.40	Seepage	0.50
Wn:					
Winship-----	60	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Slow water movement	1.00	Seepage	0.50

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Wn: (cont.) Tonka-----	30	Very limited Slow water movement Ponding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Seepage	1.00 1.00 0.50
Wo: Winship-----	60	Very limited Depth to saturated zone Slow water movement	1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 0.50
Tonka-----	30	Very limited Slow water movement Ponding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Seepage	1.00 1.00 0.50
Ws: Woonsocket-----	50	Very limited Seepage, bottom layer Depth to saturated zone Slow water movement	1.00 0.99 0.68	Very limited Seepage Depth to saturated zone	1.00 0.71
Whitelake-----	35	Very limited Seepage, bottom layer Depth to saturated zone	1.00 0.99	Very limited Seepage Depth to saturated zone	1.00 0.71
Wt: Worthing-----	90	Very limited Slow water movement Ponding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
Ww: Worthing, ponded----	90	Very limited Slow water movement Ponding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
ZaE: Zahill-----	85	Very limited Slope Slow water movement	1.00 1.00	Very limited Slope	1.00

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
ZbC:					
Zahl-----	50	Very limited Slow water movement Slope	1.00 0.01	Very limited Slope Seepage	1.00 0.50
Max-----	40	Very limited Slow water movement Slope	1.00 0.01	Very limited Slope Seepage	1.00 0.50
ZbD:					
Zahl-----	55	Very limited Slope Slow water movement	1.00 1.00	Very limited Slope Seepage	1.00 0.50
Max-----	35	Very limited Slow water movement Slope	1.00 0.63	Very limited Slope Seepage	1.00 0.50
ZgD:					
Zell-----	55	Very limited Slope Slow water movement	1.00 0.82	Very limited Slope Seepage	1.00 0.50
Great Bend-----	35	Very limited Slow water movement Slope	1.00 0.01	Very limited Slope Seepage	1.00 0.50

Landfills

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Aa: Aastad-----	85	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
Ab: Aastad-----	50	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
Hamerly-----	35	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey Depth to saturated zone	0.50 0.44
Ad: Aastad-----	60	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
Tonka-----	30	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone Too clayey	1.00 0.00 1.00
Ae: Aberdeen-----	55	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Too clayey	1.00
Nahon-----	35	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50
Ah: Aberdeen-----	55	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Too clayey Hard to compact	1.00 1.00
Nahon-----	35	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50
An: Aberdeen-----	45	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Too clayey Hard to compact	1.00 1.00

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
An: (cont.)							
Nahon-----	25	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50
Heil-----	20	Very limited Depth to saturated zone Excess sodium Ponding Too clayey	1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Hard to compact Sodium content Ponding Too clayey	1.00 1.00 1.00 1.00 0.50
Ao:							
Aberdeen-----	45	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Too clayey	1.00
Nahon-----	25	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50
Heil-----	20	Very limited Depth to saturated zone Excess sodium Ponding Too clayey	1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Hard to compact Sodium content Ponding Too clayey	1.00 1.00 1.00 1.00 0.50
At:							
Aquents, loamy-----	90	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
BaC:							
Beadle-----	80	Somewhat limited Too clayey Slope	0.50 0.01	Somewhat limited Slope	0.01	Very limited Hard to compact Too clayey Slope	1.00 0.50 0.01
BdA:							
Beadle-----	50	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50
Dudley-----	35	Very limited Depth to saturated zone Excess sodium Too clayey	1.00 1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Sodium content Too clayey	1.00 1.00 0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill	Value	Area sanitary landfill	Value	Daily cover for landfill	Value
		Rating class and limiting features		Rating class and limiting features		Rating class and limiting features	
BeA: Beadle-----	60	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50
Stickney-----	30	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50
BeB: Beadle-----	60	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50
Stickney-----	30	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50
BfA: Beadle, stony-----	60	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50
Stickney, stony-----	30	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50
BfB: Beadle, stony-----	60	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50
Stickney, stony-----	30	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50
Bg: Bearden-----	85	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Depth to saturated zone	1.00 0.44
Bk: Bearden-----	60	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Depth to saturated zone	1.00 0.44

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Bk: (cont.) Tonka-----	30	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone Too clayey	1.00 1.00 1.00
Bo: Beotia-----	90	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Too clayey	1.00
Br: Beotia-----	50	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Too clayey	1.00
Rondell-----	35	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Too sandy	0.50
Bs: Beotia-----	60	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Too clayey	1.00
Winship-----	30	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey Depth to saturated zone	0.50 0.44
Bt: Beotia-----	60	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Not limited	
Winship-----	30	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey Depth to saturated zone	0.50 0.44
Bu: Bon-----	90	Very limited Depth to saturated zone Seepage, bottom layer Too clayey Flooding	1.00 1.00 0.50 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Somewhat limited Too clayey Seepage	0.50 0.21

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Bw: Bon, channeled-----	85	Very limited Flooding Depth to saturated zone Seepage, bottom layer Too clayey	1.00 1.00 1.00 0.50	Very limited Flooding Depth to saturated zone	1.00 1.00	Somewhat limited Too clayey Seepage	0.50 0.21
BxD: Buse-----	55	Very limited Slope Too clayey	1.00 0.50	Very limited Slope	1.00	Very limited Slope	1.00
Barnes-----	35	Somewhat limited Slope Too clayey	0.63 0.50	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63
ByE: Buse, stony-----	50	Very limited Slope Too clayey	1.00 0.50	Very limited Slope	1.00	Very limited Slope	1.00
Barnes, stony-----	35	Very limited Slope Too clayey	1.00 0.50	Very limited Slope	1.00	Very limited Slope Too clayey	1.00 0.50
BzE: Buse-----	50	Very limited Slope Too clayey	1.00 0.50	Very limited Slope	1.00	Very limited Slope	1.00
Langhei-----	40	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Ca: Camtown-----	55	Very limited Depth to saturated zone Excess sodium	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Sodium content	1.00
Turton-----	30	Very limited Depth to saturated zone Excess sodium	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Sodium content	1.00
Cf: Cavour-----	55	Very limited Depth to saturated zone Excess sodium Too clayey	1.00 1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Sodium content Hard to compact Too clayey	1.00 1.00 0.50
Ferney-----	35	Very limited Depth to saturated zone Excess sodium Too clayey	1.00 1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Sodium content Too clayey	1.00 1.00 0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Co: Colvin, saline-----	85	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00
Cr: Cresbard-----	60	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
Cavour-----	30	Very limited Depth to saturated zone Excess sodium Too clayey	1.00 1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Sodium content Hard to compact Too clayey	1.00 1.00 0.50
Cs: Cresbard-----	40	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50
Cavour-----	30	Very limited Depth to saturated zone Excess sodium Too clayey	1.00 1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Sodium content Hard to compact Too clayey	1.00 1.00 0.50
Heil-----	20	Very limited Depth to saturated zone Excess sodium Ponding Too clayey	1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Hard to compact Sodium content Ponding Too clayey	1.00 1.00 1.00 1.00 0.50
Ct: Crossplain-----	60	Very limited Flooding Depth to saturated zone Too clayey	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Too clayey	1.00 0.50
Tetonka-----	30	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 0.50	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Too clayey Hard to compact Ponding	1.00 1.00 1.00 1.00
Da: Davis-----	55	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Not limited	

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Da: (cont.) Northville-----	35	Very limited Depth to saturated zone Too clayey Flooding	1.00 0.50 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Hard to compact Too clayey	1.00 0.50
Db: Davison-----	85	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey Depth to saturated zone	0.50 0.24
Dd: Davison-----	50	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey Depth to saturated zone	0.50 0.24
Tetonka-----	40	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 0.50	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Too clayey Hard to compact Ponding	1.00 1.00 1.00 1.00
DeA: Delmont-----	55	Very limited Seepage, bottom layer Too sandy	1.00 0.50	Very limited Seepage	1.00	Very limited Seepage Too sandy Gravel content	1.00 0.50 0.17
Enet-----	35	Very limited Seepage, bottom layer Too sandy	1.00 0.50	Very limited Seepage	1.00	Very limited Seepage Too sandy	1.00 0.50
Dk: Dimo-----	85	Very limited Depth to saturated zone Seepage, bottom layer Too sandy Flooding	1.00 1.00 0.50 0.40	Very limited Depth to saturated zone Seepage Flooding	1.00 1.00 0.40	Very limited Seepage Too sandy Gravel content	1.00 0.50 0.01
Dm: Dimo-----	55	Very limited Depth to saturated zone Seepage, bottom layer Too sandy Flooding	1.00 1.00 0.50 0.40	Very limited Depth to saturated zone Seepage Flooding	1.00 1.00 0.40	Very limited Seepage Depth to saturated zone Too sandy Gravel content	1.00 0.68 0.50 0.01

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Dm: (cont.) Grat-----	30	Very limited Depth to saturated zone Ponding Too sandy	1.00 1.00 0.50	Very limited Depth to saturated zone Seepage Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Seepage Ponding Too sandy	1.00 1.00 1.00 0.50
DoA: Doland-----	50	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
Embden-----	30	Very limited Depth to saturated zone Seepage, bottom layer Too sandy	1.00 1.00 0.50	Very limited Depth to saturated zone Seepage	1.00 1.00	Somewhat limited Seepage Too sandy	0.50 0.50
Dq: Dovecreek-----	90	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Not limited	
Dr: Dovray-----	90	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone Too clayey Hard to compact	1.00 1.00 1.00 1.00
Du: Dudley-----	55	Very limited Depth to saturated zone Excess sodium Too clayey	1.00 1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Sodium content Too clayey	1.00 1.00 0.50
Jerauld-----	35	Very limited Depth to saturated zone Excess sodium Too clayey	1.00 1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Sodium content Too clayey	1.00 1.00 0.50
Dx: Durrstein-----	85	Very limited Flooding Depth to saturated zone Excess sodium Too clayey	1.00 1.00 1.00 0.50	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Hard to compact Sodium content Too clayey	1.00 1.00 1.00 0.50
Ea: Eckman-----	85	Not limited		Not limited		Not limited	

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
EcA: Eckman-----	50	Not limited		Not limited		Not limited	
Gardena-----	40	Very limited Depth to saturated zone Seepage, bottom layer	1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 1.00	Somewhat limited Seepage	0.21
EcB: Eckman-----	60	Not limited		Not limited		Not limited	
Gardena-----	30	Very limited Depth to saturated zone Seepage, bottom layer	1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 1.00	Somewhat limited Seepage	0.21
EdB: Eckman-----	60	Not limited		Not limited		Not limited	
Zell-----	30	Not limited		Not limited		Not limited	
EeB: Edgeley-----	85	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Hard to compact Depth to bedrock	1.00 1.00
EeC: Edgeley-----	85	Very limited Depth to bedrock Slope	1.00 0.01	Very limited Depth to bedrock Slope	1.00 0.01	Very limited Hard to compact Depth to bedrock Slope	1.00 1.00 0.01
EeD: Edgeley-----	85	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Hard to compact Depth to bedrock Slope	1.00 1.00 1.00
EgA: Egeland-----	50	Somewhat limited Too sandy	0.50	Very limited Seepage	1.00	Somewhat limited Seepage Too sandy	0.50 0.50
Embden-----	40	Very limited Depth to saturated zone Seepage, bottom layer Too sandy	1.00 1.00 0.50	Very limited Depth to saturated zone Seepage	1.00 1.00	Somewhat limited Seepage Too sandy	0.50 0.50
EgB: Egeland-----	50	Somewhat limited Too sandy	0.50	Very limited Seepage	1.00	Somewhat limited Seepage Too sandy	0.50 0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
EgB: (cont.) Embden-----	35	Very limited Depth to saturated zone Seepage, bottom layer Too sandy	1.00 1.00 0.50	Very limited Depth to saturated zone Seepage	1.00 1.00	Somewhat limited Seepage Too sandy	0.50 0.50
Ek: Elsmere-----	85	Very limited Depth to saturated zone Too sandy	1.00 0.50	Very limited Depth to saturated zone Seepage	1.00 1.00	Somewhat limited Depth to saturated zone Too sandy	0.68 0.50
EmE: Ethan-----	50	Very limited Slope Too clayey	1.00 0.50	Very limited Slope	1.00	Very limited Slope Too clayey	1.00 0.50
Betts-----	40	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
EnD: Ethan-----	55	Very limited Slope Too clayey	1.00 0.50	Very limited Slope	1.00	Very limited Slope Too clayey	1.00 0.50
Hand-----	35	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63
Er: Exline-----	50	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey Depth to saturated zone	1.00 0.50 0.44
Aberdeen-----	25	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Too clayey Hard to compact	1.00 1.00
Nahon-----	20	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50
Et: Exline-----	50	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Too clayey Hard to compact Depth to saturated zone	1.00 1.00 0.44
Aberdeen-----	25	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Too clayey	1.00

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Et: (cont.) Nahon-----	20	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50
Ew: Exline-----	50	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey Depth to saturated zone	1.00 0.50 0.44
Heil-----	40	Very limited Depth to saturated zone Excess sodium Ponding Too clayey	1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Hard to compact Sodium content Ponding Too clayey	1.00 1.00 1.00 1.00 0.50
Ex: Exline-----	50	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Too clayey Hard to compact Depth to saturated zone	1.00 1.00 0.44
Heil-----	40	Very limited Depth to saturated zone Excess sodium Ponding Too clayey	1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Hard to compact Sodium content Ponding Too clayey	1.00 1.00 1.00 1.00 0.50
EyA: Exline-----	45	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50
Putney-----	40	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Not limited	
Fa: Farmsworth-----	50	Very limited Depth to saturated zone Too clayey Flooding	1.00 0.50 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Somewhat limited Depth to saturated zone Too clayey	0.68 0.50
Durrstein-----	35	Very limited Flooding Depth to saturated zone Excess sodium Too clayey	1.00 1.00 1.00 0.50	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Hard to compact Sodium content Too clayey	1.00 1.00 1.00 0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Fe: Ferney-----	50	Very limited Depth to saturated zone Excess sodium Too clayey	1.00 1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Sodium content Too clayey Depth to saturated zone	1.00 1.00 0.50 0.44
Heil-----	40	Very limited Depth to saturated zone Excess sodium Ponding Too clayey	1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Hard to compact Sodium content Ponding Too clayey	1.00 1.00 1.00 1.00 0.50
Ff: Forestburg-----	60	Very limited Depth to saturated zone Too sandy	1.00 0.50	Very limited Depth to saturated zone Seepage	1.00 1.00	Somewhat limited Too sandy Depth to saturated zone	0.50 0.02
Elsmere-----	30	Very limited Depth to saturated zone Too sandy	1.00 0.50	Very limited Depth to saturated zone Seepage	1.00 1.00	Somewhat limited Depth to saturated zone Too sandy	0.86 0.50
Fh: Forestburg-----	45	Very limited Depth to saturated zone Too sandy	1.00 0.50	Very limited Depth to saturated zone Seepage	1.00 1.00	Somewhat limited Too sandy Depth to saturated zone	0.50 0.02
Elsmere-----	25	Very limited Depth to saturated zone Too sandy	1.00 0.50	Very limited Depth to saturated zone Seepage	1.00 1.00	Somewhat limited Depth to saturated zone Too sandy	0.86 0.50
Toko-----	20	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Seepage Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding Seepage	1.00 1.00 0.21
FmA: Forman-----	50	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
Aastad-----	40	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
FmB: Forman-----	60	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FmB: (cont.) Aastad-----	30	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
FnC: Forman-----	55	Somewhat limited Too clayey Slope	0.50 0.01	Somewhat limited Slope	0.01	Somewhat limited Too clayey Slope	0.50 0.01
Buse-----	35	Somewhat limited Too clayey Slope	0.50 0.01	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01
FrB: Forman-----	50	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
Buse-----	25	Somewhat limited Too clayey	0.50	Not limited		Not limited	
Aastad-----	20	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
FrC: Forman-----	45	Somewhat limited Too clayey Slope	0.50 0.01	Somewhat limited Slope	0.01	Somewhat limited Too clayey Slope	0.50 0.01
Buse-----	30	Somewhat limited Too clayey Slope	0.50 0.01	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01
Aastad-----	20	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
FsA: Forman-----	55	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
Cresbard-----	30	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50
FsB: Forman-----	60	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FsB: (cont.) Cresbard-----	30	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50
FtA: Forman-----	45	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
Cresbard-----	25	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50
Tonka-----	20	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone Too clayey	1.00 1.00 1.00
Ga: Gardena-----	90	Very limited Depth to saturated zone Seepage, bottom layer	1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 1.00	Somewhat limited Seepage	0.21
Gd: Gardena-----	55	Very limited Depth to saturated zone Seepage, bottom layer	1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 1.00	Somewhat limited Seepage	0.21
Glyndon-----	35	Very limited Depth to saturated zone Seepage, bottom layer	1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 1.00	Somewhat limited Seepage Depth to saturated zone	0.21 0.02
Ge: Gardena-----	50	Very limited Depth to saturated zone Seepage, bottom layer	1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 1.00	Somewhat limited Seepage	0.21
Turton-----	35	Very limited Depth to saturated zone Excess sodium	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Sodium content	1.00
GgA: Great Bend-----	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Not limited	

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GnA: Great Bend-----	50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Not limited	
Beotia-----	40	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Too clayey	1.00
GnB: Great Bend-----	60	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Not limited	
Beotia-----	30	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Too clayey	1.00
GoA: Great Bend-----	50	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Not limited	
Beotia-----	40	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Not limited	
GpA: Great Bend-----	50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Not limited	
Putney-----	35	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Not limited	
GpB: Great Bend-----	50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Not limited	
Putney-----	35	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Not limited	
GtB: Great Bend-----	60	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Not limited	
Zell-----	30	Not limited		Not limited		Not limited	
GtC: Great Bend-----	50	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GtC: (cont.) Zell-----	40	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01
GzC: Great Bend-----	45	Not limited		Not limited		Not limited	
Zell-----	25	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01
Huffton-----	20	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01
HaA: Hamerly-----	85	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey Depth to saturated zone	0.50 0.44
Hb: Hamerly-----	50	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey Depth to saturated zone	0.50 0.44
Tonka-----	40	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone Too clayey	1.00 1.00 1.00
HcA: Hand-----	50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Not limited	
Bonilla-----	40	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Not limited	
HcB: Hand-----	60	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Not limited	
Bonilla-----	30	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Not limited	
HdA: Hand-----	50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Not limited	
Carthage-----	40	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone Seepage	1.00 1.00	Somewhat limited Too clayey	0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
He:							
Hand-----	45	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Not limited	
Carthage-----	25	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone Seepage	1.00 1.00	Somewhat limited Too clayey	0.50
Overshue-----	20	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Seepage Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
HfC:							
Hand-----	55	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01
Ethan-----	35	Somewhat limited Too clayey Slope	0.50 0.01	Somewhat limited Slope	0.01	Somewhat limited Too clayey Slope	0.50 0.01
HgB:							
Hand-----	50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Not limited	
Ethan-----	25	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Bonilla-----	20	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Not limited	
HgC:							
Hand-----	45	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01
Ethan-----	30	Somewhat limited Too clayey Slope	0.50 0.01	Somewhat limited Slope	0.01	Somewhat limited Too clayey Slope	0.50 0.01
Bonilla-----	20	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Not limited	
HhB:							
Hand-----	50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Not limited	
Ethan-----	25	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Carthage-----	20	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone Seepage	1.00 1.00	Somewhat limited Too clayey	0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HjB: Hand-----	45	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Not limited	
Talmo-----	35	Very limited Seepage, bottom layer Too sandy	1.00 0.50	Very limited Seepage	1.00	Very limited Seepage Gravel content Too sandy	1.00 1.00 0.50
HjC: Hand-----	45	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01
Talmo-----	35	Very limited Seepage, bottom layer Too sandy Slope	1.00 0.50 0.01	Very limited Seepage Slope	1.00 0.01	Very limited Seepage Gravel content Too sandy Slope	1.00 1.00 0.50 0.01
Hk: Harmony-----	55	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Too clayey Hard to compact	1.00 1.00
Aberdeen-----	35	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Too clayey	1.00
Hm: Harmony-----	55	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Not limited	
Aberdeen-----	35	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Too clayey Hard to compact	1.00 1.00
Hn: Harmony-----	55	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Not limited	
Beotia-----	35	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Too clayey	1.00
Ho: Harmony-----	55	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Too clayey Hard to compact	1.00 1.00

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ho: (cont.) Beotia-----	35	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Not limited	
Hp: Harriet-----	90	Very limited Flooding Depth to saturated zone Too clayey Excess sodium	1.00 1.00 1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Hard to compact Sodium content Too clayey	1.00 1.00 1.00 0.50
Hr: Heil-----	90	Very limited Depth to saturated zone Excess sodium Ponding Too clayey	1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Hard to compact Sodium content Ponding Too clayey	1.00 1.00 1.00 1.00 0.50
HsA: Henkin-----	55	Very limited Seepage, bottom layer	1.00	Very limited Seepage	1.00	Somewhat limited Seepage	0.21
Blendon-----	35	Very limited Depth to saturated zone Seepage, bottom layer	1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 1.00	Very limited Seepage	1.00
HsB: Henkin-----	60	Very limited Seepage, bottom layer	1.00	Very limited Seepage	1.00	Somewhat limited Seepage	0.21
Blendon-----	30	Very limited Depth to saturated zone Seepage, bottom layer	1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 1.00	Very limited Seepage	1.00
HtB: Houdek-----	50	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
Ethan-----	25	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Prosper-----	20	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HtC:							
Houdek-----	45	Somewhat limited Too clayey Slope	0.50 0.01	Somewhat limited Slope	0.01	Somewhat limited Too clayey Slope	0.50 0.01
Ethan-----	30	Somewhat limited Too clayey Slope	0.50 0.01	Somewhat limited Slope	0.01	Somewhat limited Too clayey Slope	0.50 0.01
Prosper-----	20	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
HuA:							
Houdek-----	50	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
Prosper-----	40	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
HuB:							
Houdek-----	60	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
Prosper-----	30	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
HwA:							
Houdek-----	55	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
Stickney-----	35	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50
HxA:							
Houdek-----	45	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
Stickney-----	25	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HxA: (cont.) Tetonka-----	20	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 0.50	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Too clayey Hard to compact Ponding	1.00 1.00 1.00 1.00
Hy: Hoven-----	90	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 0.50	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Hard to compact Ponding Too clayey	1.00 1.00 1.00 0.50
Ie: Ipage-----	45	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 1.00	Very limited Too sandy Seepage	1.00 1.00
Els-----	25	Very limited Depth to saturated zone Too sandy	1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 1.00	Very limited Too sandy Seepage Depth to saturated zone	1.00 1.00 0.68
Shue-----	20	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 0.50	Very limited Depth to saturated zone Seepage Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 0.50
Jh: Jerauld-----	50	Very limited Depth to saturated zone Excess sodium Too clayey	1.00 1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Sodium content Too clayey Depth to saturated zone	1.00 1.00 0.50 0.44
Hoven-----	40	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 0.50	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Hard to compact Ponding Too clayey	1.00 1.00 1.00 0.50
KaA: Kranzburg-----	50	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
Brookings-----	40	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KbB:							
Kranzburg-----	40	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
Brookings-----	30	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
Buse-----	25	Somewhat limited Too clayey	0.50	Not limited		Not limited	
KcA:							
Kranzburg-----	55	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
Cresbard-----	30	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50
KtA:							
Kranzburg-----	45	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
Cresbard-----	25	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50
Tonka-----	20	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone Too clayey	1.00 1.00 1.00
KzB:							
Kranzburg-----	40	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
Zell-----	30	Not limited		Not limited		Not limited	
Aastad-----	20	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
La:							
La Prairie-----	85	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Not limited	

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Lc: La Prairie, channeled-----	50	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Not limited	
Holmquist, channeled-----	40	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone	1.00
Ld: LaDelle-----	90	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Hard to compact	1.00
Le: LaDelle, channeled--	85	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Hard to compact	1.00
Lk: Lamo-----	90	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Hard to compact Depth to saturated zone	1.00 0.86
Lm: Lamoure-----	85	Very limited Flooding Depth to saturated zone Too clayey	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Hard to compact Too clayey	1.00 1.00 0.50
Ln: Lawet-----	85	Very limited Flooding Depth to saturated zone Seepage, bottom layer	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone	0.99
Lo: Lawet, wet-----	90	Very limited Flooding Depth to saturated zone Seepage, bottom layer Ponding	1.00 1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
Lp: Lawet-----	60	Very limited Flooding Depth to saturated zone Seepage, bottom layer	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone	0.99

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Lp: (cont.) Davison-----	30	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey Depth to saturated zone	0.50 0.24
LrA: Lehr-----	55	Very limited Seepage, bottom layer Too sandy	1.00 0.50	Very limited Seepage	1.00	Very limited Seepage Gravel content Too sandy	1.00 0.81 0.50
Bowdle-----	35	Very limited Seepage, bottom layer Too sandy	1.00 0.50	Very limited Seepage	1.00	Very limited Seepage Too sandy	1.00 0.50
LrB: Lehr-----	60	Very limited Seepage, bottom layer Too sandy	1.00 0.50	Very limited Seepage	1.00	Very limited Seepage Gravel content Too sandy	1.00 0.81 0.50
Bowdle-----	30	Very limited Seepage, bottom layer Too sandy	1.00 0.50	Very limited Seepage	1.00	Very limited Seepage Too sandy	1.00 0.50
Ls: Lowe-----	85	Very limited Flooding Depth to saturated zone Too clayey	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Too clayey	1.00 0.50
Lt: Ludden-----	85	Very limited Flooding Depth to saturated zone Too clayey	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Too clayey Hard to compact	1.00 1.00 1.00 1.00
Lu: Ludden, ponded-----	90	Very limited Flooding Depth to saturated zone Ponding Too clayey	1.00 1.00 1.00 1.00	Very limited Flooding Ponding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Too clayey Hard to compact	1.00 1.00 1.00 1.00 1.00
Lw: Ludden, wet-----	85	Very limited Flooding Depth to saturated zone Ponding Too clayey	1.00 1.00 1.00 1.00	Very limited Flooding Ponding Depth to saturated zone	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Too clayey Hard to compact	1.00 1.00 1.00 1.00 1.00
M-W: Miscellaneous water-	100	Not rated		Not rated		Not rated	

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MaC:							
Maddock-----	50	Very limited Seepage, bottom layer	1.00	Very limited Seepage	1.00	Very limited Too sandy	1.00
		Too sandy	1.00	Slope	0.01	Seepage	1.00
		Slope	0.01			Slope	0.01
Egeland-----	35	Somewhat limited Too sandy	0.50	Very limited Seepage	1.00	Somewhat limited Seepage	0.50
		Slope	0.01	Slope	0.01	Too sandy	0.50
						Slope	0.01
MdA:							
Max-----	50	Not limited		Not limited		Not limited	
Arnegard-----	40	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Not limited	
MdB:							
Max-----	60	Not limited		Not limited		Not limited	
Arnegard-----	30	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Not limited	
MgB:							
Max-----	45	Not limited		Not limited		Not limited	
Arnegard-----	30	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Not limited	
Zahl-----	20	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
MnB:							
Max-----	40	Not limited		Not limited		Not limited	
Niobell-----	30	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
		Too clayey	0.50				
Noonan-----	20	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
		Too clayey	0.50				
MxC:							
Max-----	45	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01
Zahl-----	30	Somewhat limited Too clayey	0.50	Somewhat limited Slope	0.01	Somewhat limited Too clayey	0.50
		Slope	0.01			Slope	0.01

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MxC: (cont.) Arnegard-----	20	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Not limited	
My: Miranda-----	50	Very limited Depth to saturated zone Excess sodium Too clayey	1.00 1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Sodium content Too clayey Depth to saturated zone	1.00 0.50 0.44
Heil-----	40	Very limited Depth to saturated zone Excess sodium Ponding Too clayey	1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Hard to compact Sodium content Ponding Too clayey	1.00 1.00 1.00 1.00 0.50
Mz: Moritz-----	55	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Somewhat limited Depth to saturated zone	0.68
Lowe-----	35	Very limited Flooding Depth to saturated zone Too clayey	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Too clayey	1.00 0.50
Na: Nahon-----	45	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50
Aberdeen-----	30	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Too clayey Hard to compact	1.00 1.00
Exline-----	20	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey Depth to saturated zone	1.00 0.50 0.44
Nb: Nahon-----	45	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50
Aberdeen-----	30	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Too clayey	1.00

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Nb: (cont.) Exline-----	20	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Too clayey Hard to compact Depth to saturated zone	1.00 1.00 0.44
Nc: Niobell-----	60	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
Noonan-----	30	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
Nd: Niobell-----	40	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
Noonan-----	30	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
Heil-----	20	Very limited Depth to saturated zone Excess sodium Ponding Too clayey	1.00 1.00 1.00 0.50	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Hard to compact Sodium content Ponding Too clayey	1.00 1.00 1.00 0.50
NeA: Niobell-----	40	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
Noonan-----	30	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
Max-----	20	Not limited		Not limited		Not limited	
Nm: Noonan-----	55	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Nm: (cont.) Miranda-----	35	Very limited Depth to saturated zone Excess sodium Too clayey	1.00 1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Sodium content Too clayey	1.00 0.50
Nr: Northville-----	60	Very limited Depth to saturated zone Too clayey Flooding	1.00 0.50 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Hard to compact Too clayey	1.00 0.50
Farmsworth-----	30	Very limited Depth to saturated zone Too clayey Flooding	1.00 0.50 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Somewhat limited Depth to saturated zone Too clayey	0.68 0.50
Nv: Northville-----	40	Very limited Depth to saturated zone Too clayey Flooding	1.00 0.50 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Hard to compact Too clayey	1.00 0.50
Farmsworth-----	30	Very limited Depth to saturated zone Too clayey Flooding	1.00 0.50 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Somewhat limited Depth to saturated zone Too clayey	0.68 0.50
Hoven-----	20	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 0.50	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Hard to compact Ponding Too clayey	1.00 1.00 1.00 0.50
Ov: Overshue-----	90	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Seepage Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
Pa: Parnell-----	90	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone Too clayey Hard to compact	1.00 1.00 1.00 1.00
Pc: Parshall-----	85	Very limited Seepage, bottom layer Too sandy	1.00 0.50	Very limited Seepage	1.00	Somewhat limited Seepage Too sandy	0.50 0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
PeA: Peever-----	85	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50
PgB: Peever-----	60	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50
Buse-----	30	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
PoA: Peever-----	60	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50
Cavour-----	30	Very limited Depth to saturated zone Excess sodium Too clayey	1.00 1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Sodium content Hard to compact Too clayey	1.00 1.00 0.50
Pp: Pits, gravel and sand-----	90	Very limited Seepage, bottom layer Too sandy Slope	1.00 1.00 1.00	Very limited Seepage Slope	1.00 1.00	Very limited Too sandy Seepage Slope Gravel content	1.00 1.00 1.00 0.65
Pr: Playmoor-----	85	Very limited Flooding Depth to saturated zone Too clayey	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Hard to compact Too clayey	1.00 1.00 0.50
Py: Playmoor, channeled--	50	Very limited Flooding Depth to saturated zone Too clayey	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Hard to compact Too clayey	1.00 1.00 0.50
Lamoure, channeled--	40	Very limited Flooding Depth to saturated zone Too clayey	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Hard to compact Too clayey	1.00 1.00 0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ra: Ranslo-----	85	Very limited Flooding Depth to saturated zone Excess sodium Too clayey	1.00 1.00 1.00 0.50	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Sodium content Hard to compact Depth to saturated zone Too clayey	1.00 1.00 0.86 0.50
Re: Ranslo-----	50	Very limited Flooding Depth to saturated zone Excess sodium Too clayey	1.00 1.00 1.00 0.50	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Sodium content Hard to compact Depth to saturated zone Too clayey	1.00 1.00 0.86 0.50
Harriet-----	40	Very limited Flooding Depth to saturated zone Too clayey Excess sodium	1.00 1.00 1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Hard to compact Sodium content Too clayey	1.00 1.00 1.00 0.50
RfA: Renshaw-----	55	Very limited Seepage, bottom layer Too sandy	1.00 0.50	Very limited Seepage	1.00	Very limited Seepage Too sandy Gravel content	1.00 0.50 0.49
Fordville-----	35	Very limited Seepage, bottom layer Too sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Too sandy Seepage	1.00 1.00
RfB: Renshaw-----	60	Very limited Seepage, bottom layer Too sandy	1.00 0.50	Very limited Seepage	1.00	Very limited Seepage Too sandy Gravel content	1.00 0.50 0.49
Fordville-----	30	Very limited Seepage, bottom layer Too sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Too sandy Seepage	1.00 1.00
So: Southam-----	90	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone Too clayey Hard to compact	1.00 1.00 1.00 1.00
St: Stickney-----	60	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
St: (cont.) Dudley-----	30	Very limited Depth to saturated zone Excess sodium Too clayey	1.00 1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Sodium content Too clayey	1.00 1.00 0.50
Su: Stickney-----	40	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Too clayey	1.00 0.50
Dudley-----	30	Very limited Depth to saturated zone Excess sodium Too clayey	1.00 1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Sodium content Too clayey	1.00 1.00 0.50
Hoven-----	20	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 0.50	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Hard to compact Ponding Too clayey	1.00 1.00 1.00 0.50
Sw: Straw, channeled----	85	Very limited Flooding Depth to saturated zone Seepage, bottom layer	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 1.00	Somewhat limited Seepage	0.21
Sx: Straw-----	90	Very limited Depth to saturated zone Seepage, bottom layer Flooding	1.00 1.00 0.40	Very limited Depth to saturated zone Seepage Flooding	1.00 1.00 0.40	Somewhat limited Seepage	0.21
TbE: Talmo, stony-----	45	Very limited Seepage, bottom layer Slope Too sandy	1.00 1.00 0.50	Very limited Seepage Slope	1.00 1.00	Very limited Seepage Gravel content Slope Too sandy	1.00 1.00 1.00 0.50
Ethan, stony-----	35	Very limited Slope Too clayey	1.00 0.50	Very limited Slope	1.00	Very limited Slope Too clayey	1.00 0.50
Te: Tetonka-----	90	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 0.50	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Too clayey Hard to compact Ponding	1.00 1.00 1.00 1.00

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Tk: Toko-----	90	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Seepage Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding Seepage	1.00 1.00 0.21
Tm: Toko, wet-----	90	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Ponding Depth to saturated zone Seepage	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone Seepage	1.00 1.00 0.21
Tn: Tonka-----	90	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone Too clayey	1.00 1.00 1.00
To: Tonka-----	60	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone Too clayey	1.00 1.00 1.00
Rimlap-----	30	Very limited Depth to saturated zone Too clayey Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Too clayey Hard to compact Ponding	1.00 1.00 1.00 1.00
Us: Udorthents, silty---	90	Not limited		Not limited		Not limited	
Va: Vallars-----	60	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Too clayey	1.00 0.50
Hamerly-----	30	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey Depth to saturated zone	0.50 0.44
VgA: Vang-----	85	Very limited Seepage, bottom layer Too sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Too sandy Seepage Gravel content	1.00 1.00 0.08
W: Water-----	100	Not rated		Not rated		Not rated	

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WaA: Williams-----	50	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Bowbells-----	40	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
WaB: Williams-----	60	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Bowbells-----	30	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
WbA: Williams-----	45	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Bowbells-----	25	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
Tonka-----	20	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone Too clayey	1.00 1.00 1.00
WbB: Williams-----	50	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Bowbells-----	25	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
Tonka-----	20	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone Too clayey	1.00 1.00 1.00
WcA: Williams-----	55	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Niobell-----	30	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
WcB: Williams-----	60	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WcB: (cont.) Niobell-----	30	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
WdA: Williams-----	45	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Niobell-----	25	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
Tonka-----	20	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone Too clayey	1.00 1.00 1.00
WhD: Williams-----	50	Somewhat limited Too clayey Slope	0.50 0.01	Somewhat limited Slope	0.01	Somewhat limited Too clayey Slope	0.50 0.01
Vida-----	40	Somewhat limited Slope Too clayey	0.63 0.50	Somewhat limited Slope	0.63	Somewhat limited Slope Too clayey	0.63 0.50
WmB: Williams-----	50	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Zahl-----	25	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Bowbells-----	20	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50
WmC: Williams-----	45	Somewhat limited Too clayey Slope	0.50 0.01	Somewhat limited Slope	0.01	Somewhat limited Too clayey Slope	0.50 0.01
Zahl-----	30	Somewhat limited Too clayey Slope	0.50 0.01	Somewhat limited Slope	0.01	Somewhat limited Too clayey Slope	0.50 0.01
Bowbells-----	20	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey	0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Wn: Winship-----	60	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey Depth to saturated zone	0.50 0.44
Tonka-----	30	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone Too clayey	1.00 1.00 1.00
Wo: Winship-----	60	Very limited Depth to saturated zone Too clayey	1.00 0.50	Very limited Depth to saturated zone	1.00	Somewhat limited Too clayey Depth to saturated zone	0.50 0.44
Tonka-----	30	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 0.50	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone Too clayey	1.00 1.00 1.00
Ws: Woonsocket-----	50	Very limited Depth to saturated zone Seepage, bottom layer	1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 1.00	Very limited Seepage	1.00
Whitelake-----	35	Very limited Depth to saturated zone Seepage, bottom layer	1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 1.00	Somewhat limited Seepage	0.21
Wt: Worthing-----	90	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone Too clayey Hard to compact	1.00 1.00 1.00 1.00
Ww: Worthing, ponded----	90	Very limited Depth to saturated zone Ponding Too clayey	1.00 1.00 1.00	Very limited Ponding Depth to saturated zone	1.00 1.00	Very limited Ponding Depth to saturated zone Too clayey Hard to compact	1.00 1.00 1.00 1.00
ZaE: Zahill-----	85	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ZbC:							
Zahl-----	50	Somewhat limited Too clayey Slope	0.50 0.01	Somewhat limited Slope	0.01	Somewhat limited Too clayey Slope	0.50 0.01
Max-----	40	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01
ZbD:							
Zahl-----	55	Very limited Slope Too clayey	1.00 0.50	Very limited Slope	1.00	Very limited Slope Too clayey	1.00 0.50
Max-----	35	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63
ZgD:							
Zell-----	55	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
Great Bend-----	35	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01	Somewhat limited Slope	0.01

Source of Gravel and Sand

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Aa:					
Aastad-----	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ab:					
Aastad-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Hamerly-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ad:					
Aastad-----	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Tonka-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ae:					
Aberdeen-----	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Nahon-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ah:					
Aberdeen-----	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Nahon-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
An:					
Aberdeen-----	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Nahon-----	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Heil-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Ao:					
Aberdeen-----	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Nahon-----	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Heil-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
At:					
Aquents, loamy-----	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BaC:					
Beadle-----	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BdA:					
Beadle-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Dudley-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BeA:					
Beadle-----	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Stickney-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BeB:					
Beadle-----	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Stickney-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BfA:					
Beadle, stony-----	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Stickney, stony-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
BfB:					
Beadle, stony-----	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Stickney, stony-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Bg:					
Bearden-----	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Bk:					
Bearden-----	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Tonka-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Bo:					
Beotia-----	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Br:					
Beotia-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Rondell-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Bs:					
Beotia-----	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Winship-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Bt:					
Beotia-----	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Winship-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Bu:					
Bon-----	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Bw:					
Bon, channeled-----	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BxD:					
Buse-----	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Barnes-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
ByE:					
Buse, stony-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Barnes, stony-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BzE:					
Buse-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Langhei-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ca:					
Camtown-----	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Turton-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Cf:					
Cavour-----	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ferney-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Co:					
Colvin, saline-----	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Cr:					
Cresbard-----	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Cr: (cont.)					
Cavour-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Cs:					
Cresbard-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Cavour-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Heil-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ct:					
Crossplain-----	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Tetonka-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Da:					
Davis-----	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Northville-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Db:					
Davison-----	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Dd:					
Davison-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Tetonka-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
DeA:					
Delmont-----	55	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Enet-----	35	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Dk:					
Dimo-----	85	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.01	Bottom layer	0.01
Dm:					
Dimo-----	55	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.01	Bottom layer	0.01
Grat-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
DoA:					
Doland-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Embdn-----	30	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.05
Dq:					
Dovecreek-----	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Dr:					
Dovray-----	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Du:					
Dudley-----	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Jerauld-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Dx:					
Durrstein-----	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ea:					
Eckman-----	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
EcA:					
Eckman-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Gardena-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
EcB:					
Eckman-----	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Gardena-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
EdB:					
Eckman-----	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Zell-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
EeB:					
Edgeley-----	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
EeC:					
Edgeley-----	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
EeD:					
Edgeley-----	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
EgA:					
Egeland-----	50	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.01
		Thickest layer	0.00	Bottom layer	0.04
Embden-----	40	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.05
EgB:					
Egeland-----	50	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.01
		Thickest layer	0.00	Bottom layer	0.04
Embden-----	35	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.05
Ek:					
Elsmere-----	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
EmE:					
Ethan-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
EmE: (cont.)					
Betts-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
EnD:					
Ethan-----	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Hand-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Er:					
Exline-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Aberdeen-----	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Nahon-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Et:					
Exline-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Aberdeen-----	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Nahon-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ew:					
Exline-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Heil-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ex:					
Exline-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Heil-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
EyA:					
Exline-----	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Putney-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Fa:					
Farmsworth-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Durrstein-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Fe:					
Ferney-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Heil-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ff:					
Forestburg-----	60	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.01
Elsmere-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Fh:					
Forestburg-----	45	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.01
Elsmere-----	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Toko-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
FmA:					
Forman-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Aastad-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
FmB:					
Forman-----	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Aastad-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
FnC:					
Forman-----	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Buse-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
FrB:					
Forman-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Buse-----	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Aastad-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
FrC:					
Forman-----	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Buse-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Aastad-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
FsA:					
Forman-----	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Cresbard-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
FsB:					
Forman-----	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Cresbard-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
FtA:					
Forman-----	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Cresbard-----	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Tonka-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ga:					
Gardena-----	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Gd:					
Gardena-----	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Glyndon-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ge:					
Gardena-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Turton-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GgA:					
Great Bend-----	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GnA:					
Great Bend-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Beotia-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GnB:					
Great Bend-----	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Beotia-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
GoA:					
Great Bend-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Beotia-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GpA:					
Great Bend-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Putney-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GpB:					
Great Bend-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Putney-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GtB:					
Great Bend-----	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Zell-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GtC:					
Great Bend-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Zell-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GzC:					
Great Bend-----	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Zell-----	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Huffton-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
HaA:					
Hamerly-----	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Hb:					
Hamerly-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Tonka-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HcA:					
Hand-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Bonilla-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HcB:					
Hand-----	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Bonilla-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HdA:					
Hand-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Carthage-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
He:					
Hand-----	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Carthage-----	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Overshue-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HfC:					
Hand-----	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
HfC: (cont.)					
Ethan-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HgB:					
Hand-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ethan-----	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Bonilla-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HgC:					
Hand-----	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ethan-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Bonilla-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HhB:					
Hand-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ethan-----	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Carthage-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HjB:					
Hand-----	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Talmo-----	35	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.12	Thickest layer	0.00
HjC:					
Hand-----	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Talmo-----	35	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.12	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Hk:					
Harmony-----	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Aberdeen-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Hm:					
Harmony-----	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Aberdeen-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Hn:					
Harmony-----	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Beotia-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ho:					
Harmony-----	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Beotia-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Hp:					
Harriet-----	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Hr:					
Heil-----	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HsA:					
Henkin-----	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Blendon-----	35	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.05
HsB:					
Henkin-----	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
HsB: (cont.)					
Blendon-----	30	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.05
HtB:					
Houdek-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ethan-----	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Prosper-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HtC:					
Houdek-----	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ethan-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Prosper-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HuA:					
Houdek-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Prosper-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HuB:					
Houdek-----	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Prosper-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HwA:					
Houdek-----	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Stickney-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
HxA:					
Houdek-----	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Stickney-----	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Tetonka-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Hy:					
Hoven-----	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ie:					
Ipage-----	45	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.24
Els-----	25	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.26
Shue-----	20	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.06
Jh:					
Jerauld-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Hoven-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
KaA:					
Kranzburg-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Brookings-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
KbB:					
Kranzburg-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Brookings-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Buse-----	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
KcA:					
Kranzburg-----	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Cresbard-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
KtA:					
Kranzburg-----	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Cresbard-----	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Tonka-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
KzB:					
Kranzburg-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Zell-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Aastad-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
La:					
La Prairie-----	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Lc:					
La Prairie, channeled-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Holmquist, channeled-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ld:					
LaDelle-----	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Le:					
LaDelle, channeled--	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Lk:					
Lamo-----	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Lm:					
Lamoure-----	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ln:					
Lawet-----	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Lo:					
Lawet, wet-----	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Lp:					
Lawet-----	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Davison-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
LrA:					
Lehr-----	55	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.24	Thickest layer	0.00
Bowdle-----	35	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
LrB:					
Lehr-----	60	Fair		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.24	Thickest layer	0.00
Bowdle-----	30	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Ls:					
Lowe-----	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Lt:					
Ludden-----	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Lu:					
Ludden, ponded-----	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Lw:					
Ludden, wet-----	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
M-W:					
Miscellaneous water-	100	Not rated		Not rated	
MaC:					
Maddock-----	50	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.42
Egeland-----	35	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.01
		Thickest layer	0.00	Bottom layer	0.04
MdA:					
Max-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Arnegard-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MdB:					
Max-----	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Arnegard-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MgB:					
Max-----	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Arnegard-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Zahl-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MnB:					
Max-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Niobell-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Noonan-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
MxC:					
Max-----	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Zahl-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Arnegard-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
My:					
Miranda-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Heil-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Mz:					
Moritz-----	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Lowe-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Na:					
Nahon-----	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Aberdeen-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Exline-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Nb:					
Nahon-----	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Aberdeen-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Exline-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Nc:					
Niobell-----	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Nc: (cont.)					
Noonan-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Nd:					
Niobell-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Noonan-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Heil-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
NeA:					
Niobell-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Noonan-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Max-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Nm:					
Noonan-----	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Miranda-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Nr:					
Northville-----	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Farmsworth-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Nv:					
Northville-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Farmsworth-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Hoven-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Ov: Overshue-----	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Pa: Parnell-----	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Pc: Parshall-----	85	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.03
PeA: Peever-----	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
PgB: Peever-----	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Buse-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
PoA: Peever-----	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Cavour-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Pp: Pits, gravel and sand-----	90	Fair		Fair	
		Thickest layer	0.01	Thickest layer	0.00
		Bottom layer	0.05	Bottom layer	0.82
Pr: Playmoor-----	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Py: Playmoor, channeled-	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Lamoure, channeled--	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Ra:					
Ranslo-----	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Re:					
Ranslo-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Harriet-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RfA:					
Renshaw-----	55	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.08	Bottom layer	0.01
Fordville-----	35	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.01	Bottom layer	0.82
RfB:					
Renshaw-----	60	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.08	Bottom layer	0.01
Fordville-----	30	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.01	Bottom layer	0.82
So:					
Southam-----	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
St:					
Stickney-----	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Dudley-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Su:					
Stickney-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Dudley-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Hoven-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Sw: Straw, channeled----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Sx: Straw-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
TbE: Talmo, stony-----	45	Fair Thickest layer Bottom layer	0.00 0.12	Poor Bottom layer Thickest layer	0.00 0.00
Ethan, stony-----	35	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Te: Tetonka-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Tk: Toko-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Tm: Toko, wet-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Tn: Tonka-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
To: Tonka-----	60	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Rimlap-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Us: Udorthents, silty---	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Va: Vallars-----	60	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Hamerly-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
VgA:					
Vang-----	85	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.05	Bottom layer	0.54
W:					
Water-----	100	Not rated		Not rated	
WaA:					
Williams-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Bowbells-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
WaB:					
Williams-----	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Bowbells-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
WbA:					
Williams-----	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Bowbells-----	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Tonka-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
WbB:					
Williams-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Bowbells-----	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Tonka-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
WcA:					
Williams-----	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Niobell-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
WcB:					
Williams-----	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Niobell-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
WdA:					
Williams-----	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Niobell-----	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Tonka-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
WhD:					
Williams-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Vida-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
WmB:					
Williams-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Zahl-----	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Bowbells-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
WmC:					
Williams-----	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Zahl-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Bowbells-----	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Wn:					
Winship-----	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Wn: (cont.)					
Tonka-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Wo:					
Winship-----	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Tonka-----	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ws:					
Woonsocket-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Whitelake-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Wt:					
Worthing-----	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ww:					
Worthing, ponded----	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
ZaE:					
Zahill-----	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
ZbC:					
Zahl-----	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Max-----	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
ZbD:					
Zahl-----	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Max-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
ZgD: Zell-----	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Great Bend-----	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Source of Reclamation Material, Roadfill, and Topsoil

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Aa: Aastad-----	85	Fair Organic matter content low Too clayey Carbonate content Water erosion	0.12 0.95 0.97 0.99	Poor Low strength Shrink-swell	0.00 0.87	Fair Too clayey	0.95
Ab: Aastad-----	50	Fair Organic matter content low Too clayey Carbonate content Water erosion	0.12 0.95 0.97 0.99	Poor Low strength Shrink-swell	0.00 0.87	Fair Too clayey	0.95
Hamerly-----	35	Fair Organic matter content low Carbonate content Water erosion	0.12 0.68 0.99	Fair Low strength Shrink-swell Wetness depth	0.22 0.87 0.91	Fair Wetness depth	0.91
Ad: Aastad-----	60	Fair Organic matter content low Too clayey Carbonate content Water erosion	0.12 0.95 0.97 0.99	Poor Low strength Shrink-swell	0.00 0.87	Fair Too clayey	0.95
Tonka-----	30	Poor Too clayey Organic matter content low Water erosion	0.00 0.50 0.90	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.61	Poor Wetness depth Too clayey	0.00 0.00
Ae: Aberdeen-----	55	Fair Too clayey Organic matter content low Water erosion Sodium content	0.08 0.12 0.90 0.97	Poor Low strength Shrink-swell	0.00 0.49	Fair Too clayey Sodium content Salinity	0.08 0.22 0.88
Nahon-----	35	Fair Too clayey Organic matter content low Salinity Sodium content Water erosion	0.02 0.50 0.88 0.97 0.99	Poor Low strength Shrink-swell	0.00 0.34	Poor Salinity Too clayey Sodium content	0.00 0.01 0.22

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ah:							
Aberdeen-----	55	Fair		Poor		Fair	
		Too clayey	0.08	Low strength	0.00	Too clayey	0.06
		Organic matter content low	0.50	Shrink-swell	0.81	Sodium content	0.22
		Water erosion	0.90			Salinity	0.88
		Sodium content	0.97				
Nahon-----	35	Fair		Poor		Poor	
		Too clayey	0.02	Low strength	0.00	Salinity	0.00
		Organic matter content low	0.50	Shrink-swell	0.34	Too clayey	0.01
		Salinity	0.88			Sodium content	0.22
		Sodium content	0.97				
		Water erosion	0.99				
An:							
Aberdeen-----	45	Fair		Poor		Fair	
		Too clayey	0.08	Low strength	0.00	Too clayey	0.06
		Organic matter content low	0.50	Shrink-swell	0.81	Sodium content	0.22
		Water erosion	0.90			Salinity	0.88
		Sodium content	0.97				
Nahon-----	25	Fair		Poor		Poor	
		Too clayey	0.02	Low strength	0.00	Salinity	0.00
		Organic matter content low	0.50	Shrink-swell	0.34	Too clayey	0.01
		Salinity	0.88			Sodium content	0.22
		Sodium content	0.97				
		Water erosion	0.99				
Heil-----	20	Poor		Poor		Poor	
		Too clayey	0.00	Wetness depth	0.00	Too clayey	0.00
		Sodium content	0.00	Low strength	0.00	Wetness depth	0.00
		Organic matter content low	0.12	Shrink-swell	0.12	Sodium content	0.00
		Salinity	0.88			Salinity	0.00
		Water erosion	0.99				
Ao:							
Aberdeen-----	45	Fair		Poor		Fair	
		Too clayey	0.08	Low strength	0.00	Too clayey	0.08
		Organic matter content low	0.12	Shrink-swell	0.49	Sodium content	0.22
		Water erosion	0.90			Salinity	0.88
		Sodium content	0.97				
Nahon-----	25	Fair		Poor		Poor	
		Too clayey	0.02	Low strength	0.00	Salinity	0.00
		Organic matter content low	0.50	Shrink-swell	0.34	Too clayey	0.01
		Salinity	0.88			Sodium content	0.22
		Sodium content	0.97				
		Water erosion	0.99				

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ao: (cont.) Heil-----	20	Poor Too clayey Sodium content Organic matter content low Salinity Water erosion	0.00 0.00 0.12 0.88 0.99	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.12	Poor Too clayey Wetness depth Sodium content Salinity	0.00 0.00 0.00 0.00
At: Aguents, loamy-----	90	Fair Organic matter content low	0.12	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.87	Poor Wetness depth	0.00
BaC: Beadle-----	80	Fair Too clayey Organic matter content low Water erosion	0.08 0.50 0.99	Poor Low strength Shrink-swell	0.00 0.12	Fair Too clayey	0.07
BdA: Beadle-----	50	Fair Too clayey Organic matter content low Water erosion	0.08 0.50 0.99	Poor Low strength Shrink-swell	0.00 0.12	Fair Too clayey	0.07
Dudley-----	35	Poor Sodium content Organic matter content low Too clayey Salinity Water erosion	0.00 0.12 0.12 0.50 0.99	Poor Low strength Shrink-swell	0.00 0.41	Poor Salinity Too clayey Sodium content	0.00 0.10 0.78
BeA: Beadle-----	60	Fair Too clayey Organic matter content low Water erosion	0.08 0.50 0.99	Poor Low strength Shrink-swell	0.00 0.12	Fair Too clayey	0.07
Stickney-----	30	Fair Sodium content Organic matter content low Salinity Water erosion	0.22 0.50 0.88 0.99	Poor Low strength Shrink-swell	0.00 0.72	Poor Salinity Sodium content	0.00 0.22
BeB: Beadle-----	60	Fair Too clayey Organic matter content low Water erosion	0.08 0.50 0.99	Poor Low strength Shrink-swell	0.00 0.12	Fair Too clayey	0.07

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BeB: (cont.) Stickney-----	30	Fair Sodium content Organic matter content low Salinity Water erosion	0.22 0.50 0.88 0.99	Poor Low strength Shrink-swell	0.00 0.72	Poor Salinity Sodium content	0.00 0.22
BfA: Beadle, stony-----	60	Fair Too clayey Organic matter content low Water erosion	0.08 0.50 0.99	Poor Low strength Shrink-swell	0.00 0.12	Fair Too clayey Rock fragments	0.07 0.87
Stickney, stony-----	30	Fair Sodium content Organic matter content low Salinity Water erosion	0.22 0.50 0.88 0.99	Poor Low strength Shrink-swell	0.00 0.72	Poor Salinity Sodium content	0.00 0.22
BfB: Beadle, stony-----	60	Fair Too clayey Organic matter content low Water erosion	0.08 0.50 0.99	Poor Low strength Shrink-swell	0.00 0.12	Fair Too clayey	0.07
Stickney, stony-----	30	Fair Sodium content Organic matter content low Salinity Water erosion	0.22 0.50 0.88 0.99	Poor Low strength Shrink-swell	0.00 0.72	Poor Salinity Sodium content	0.00 0.22
Bg: Bearden-----	85	Fair Carbonate content Organic matter content low Water erosion Sodium content	0.46 0.50 0.90 0.97	Poor Low strength Shrink-swell Wetness depth	0.00 0.87 0.91	Fair Wetness depth Sodium content	0.91 0.98
Bk: Bearden-----	60	Fair Carbonate content Organic matter content low Water erosion Sodium content	0.46 0.50 0.90 0.97	Poor Low strength Shrink-swell Wetness depth	0.00 0.87 0.91	Fair Wetness depth Sodium content	0.91 0.98
Tonka-----	30	Poor Too clayey Organic matter content low Water erosion	0.00 0.50 0.90	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.61	Poor Wetness depth Too clayey	0.00 0.00

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Bo:							
Beotia-----	90	Fair		Poor		Good	
		Organic matter	0.12	Low strength	0.00		
		content low		Shrink-swell	0.87		
		Water erosion	0.90				
		Carbonate content	0.92				
Br:							
Beotia-----	50	Fair		Poor		Good	
		Organic matter	0.12	Low strength	0.00		
		content low		Shrink-swell	0.87		
		Water erosion	0.90				
		Carbonate content	0.92				
Rondell-----	35	Fair		Poor		Fair	
		Organic matter	0.12	Low strength	0.00	Salinity	0.88
		content low				Carbonate content	0.92
		Carbonate content	0.32				
		Water erosion	0.90				
Bs:							
Beotia-----	60	Fair		Poor		Good	
		Organic matter	0.12	Low strength	0.00		
		content low		Shrink-swell	0.87		
		Water erosion	0.90				
		Carbonate content	0.92				
Winship-----	30	Fair		Poor		Fair	
		Water erosion	0.99	Low strength	0.00	Wetness depth	0.91
				Wetness depth	0.91		
				Shrink-swell	0.98		
Bt:							
Beotia-----	60	Fair		Poor		Good	
		Carbonate content	0.92	Low strength	0.00		
		Water erosion	0.99	Shrink-swell	0.89		
Winship-----	30	Fair		Poor		Fair	
		Water erosion	0.99	Low strength	0.00	Wetness depth	0.91
				Wetness depth	0.91		
				Shrink-swell	0.94		
Bu:							
Bon-----	90	Good		Fair		Good	
				Low strength	0.22		
Bw:							
Bon, channeled-----	85	Good		Fair		Good	
				Low strength	0.22		
BxD:							
Buse-----	55	Fair		Fair		Poor	
		Organic matter	0.12	Low strength	0.22	Slope	0.00
		content low		Shrink-swell	0.87	Carbonate content	0.76
		Carbonate content	0.46				
		Water erosion	0.99				

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BxD: (cont.) Barnes-----	35	Fair Organic matter content low Carbonate content Water erosion	0.12 0.92 0.99	Poor Low strength Shrink-swell	0.00 0.87	Fair Slope	0.37
ByE: Buse, stony-----	50	Fair Organic matter content low Carbonate content	0.12 0.80	Poor Slope Low strength Shrink-swell	0.00 0.78 0.87	Poor Slope Carbonate content	0.00 0.92
Barnes, stony-----	35	Fair Organic matter content low Carbonate content Water erosion	0.50 0.92 0.99	Fair Low strength Slope	0.22 0.92	Poor Slope Hard to reclaim (rock fragments) Rock fragments	0.00 0.95 0.98
BzE: Buse-----	50	Fair Organic matter content low Carbonate content Water erosion	0.12 0.46 0.99	Poor Slope Low strength Shrink-swell	0.00 0.22 0.87	Poor Slope Carbonate content	0.00 0.76
Langhei-----	40	Fair Organic matter content low Carbonate content	0.12 0.46	Poor Low strength Slope	0.00 0.00	Poor Slope Carbonate content	0.00 0.96
Ca: Camtown-----	55	Poor Sodium content Organic matter content low Water erosion	0.00 0.12 0.99	Fair Shrink-swell	0.99	Poor Sodium content Salinity	0.00 0.50
Turton-----	30	Poor Sodium content Too alkaline Organic matter content low Salinity Water erosion Carbonate content	0.00 0.00 0.12 0.88 0.90 0.92	Fair Shrink-swell	0.99	Poor Salinity Sodium content	0.00 0.22
Cf: Cavour-----	55	Fair Organic matter content low Too clayey Salinity Sodium content Carbonate content Water erosion	0.12 0.12 0.50 0.90 0.99 0.99	Poor Low strength Shrink-swell	0.00 0.31	Poor Sodium content Salinity Too clayey	0.00 0.00 0.08

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Cf: (cont.) Ferney-----	35	Poor Sodium content Too clayey Organic matter content low Salinity Carbonate content	0.00 0.08 0.50 0.88 0.97	Poor Low strength Shrink-swell	0.00 0.12	Poor Sodium content Salinity Too clayey	0.00 0.00 0.05
Co: Colvin, saline-----	85	Fair Carbonate content Salinity Sodium content Water erosion	0.68 0.88 0.97 0.99	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.87	Poor Wetness depth Salinity Sodium content	0.00 0.00 0.98
Cr: Cresbard-----	60	Fair Too clayey Organic matter content low Sodium content Water erosion	0.08 0.12 0.90 0.99	Poor Low strength Shrink-swell	0.00 0.45	Fair Too clayey Sodium content	0.05 0.22
Cavour-----	30	Fair Organic matter content low Too clayey Salinity Sodium content Carbonate content Water erosion	0.12 0.12 0.50 0.90 0.99 0.99	Poor Low strength Shrink-swell	0.00 0.31	Poor Sodium content Salinity Too clayey	0.00 0.00 0.08
Cs: Cresbard-----	40	Fair Too clayey Organic matter content low Sodium content Water erosion	0.08 0.12 0.90 0.99	Poor Low strength Shrink-swell	0.00 0.45	Fair Too clayey Sodium content	0.05 0.22
Cavour-----	30	Fair Organic matter content low Too clayey Salinity Sodium content Carbonate content Water erosion	0.12 0.12 0.50 0.90 0.99 0.99	Poor Low strength Shrink-swell	0.00 0.31	Poor Sodium content Salinity Too clayey	0.00 0.00 0.08
Heil-----	20	Poor Too clayey Sodium content Organic matter content low Salinity Water erosion	0.00 0.00 0.12 0.88 0.99	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.12	Poor Too clayey Wetness depth Sodium content Salinity	0.00 0.00 0.00 0.00

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ct: Crossplain-----	60	Fair Too clayey Organic matter content low Water erosion	0.08 0.88 0.99	Poor Low strength Wetness depth Shrink-swell	0.00 0.00 0.68	Poor Wetness depth Too clayey	0.00 0.08
Tetonka-----	30	Poor Too clayey Organic matter content low Water erosion	0.00 0.50 0.99	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.16	Poor Wetness depth Too clayey	0.00 0.00
Da: Davis-----	55	Good		Poor Low strength	0.00	Good	
Northville-----	35	Fair Sodium content Too clayey Salinity Water erosion	0.22 0.50 0.88 0.99	Poor Low strength Shrink-swell	0.00 0.72	Poor Salinity Sodium content Too clayey	0.00 0.22 0.41
Db: Davison-----	85	Fair Organic matter content low Carbonate content Water erosion	0.50 0.80 0.99	Fair Shrink-swell Wetness depth	0.93 0.98	Fair Carbonate content Wetness depth	0.97 0.98
Dd: Davison-----	50	Fair Organic matter content low Carbonate content Water erosion	0.50 0.80 0.99	Fair Shrink-swell Wetness depth	0.93 0.98	Fair Carbonate content Wetness depth	0.97 0.98
Tetonka-----	40	Poor Too clayey Organic matter content low Water erosion	0.00 0.50 0.99	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.16	Poor Wetness depth Too clayey	0.00 0.00
DeA: Delmont-----	55	Fair Organic matter content low Too sandy	0.12 0.14	Good		Poor Rock fragments Too sandy Hard to reclaim (rock fragments)	0.00 0.14 0.14
Enet-----	35	Fair Organic matter content low	0.12	Good		Fair Hard to reclaim (rock fragments)	0.82
Dk: Dimo-----	85	Fair Organic matter content low	0.12	Good		Fair Hard to reclaim (rock fragments)	0.08

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Dm: Dimo-----	55	Fair Organic matter content low	0.12	Fair Wetness depth	0.76	Fair Hard to reclaim (rock fragments) Wetness depth	0.08 0.76
Grat-----	30	Fair Too clayey Organic matter content low Carbonate content	0.02 0.50 0.88	Poor Wetness depth Shrink-swell	0.00 0.97	Poor Wetness depth Too clayey	0.00 0.02
DoA: Doland-----	50	Fair Organic matter content low	0.12	Poor Low strength Shrink-swell	0.00 0.99	Good	
Embden-----	30	Fair Organic matter content low	0.50	Good		Good	
Dq: Dovecreek-----	90	Fair Organic matter content low	0.12	Poor Low strength Shrink-swell	0.00 0.93	Good	
Dr: Dovray-----	90	Poor Too clayey Water erosion	0.00 0.99	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.12	Poor Too clayey Wetness depth	0.00 0.00
Du: Dudley-----	55	Poor Sodium content Organic matter content low Too clayey Salinity Water erosion	0.00 0.12 0.12 0.50 0.99	Poor Low strength Shrink-swell	0.00 0.41	Poor Salinity Too clayey Sodium content	0.00 0.10 0.78
Jerauld-----	35	Poor Sodium content Too clayey Organic matter content low Salinity Water erosion	0.00 0.08 0.12 0.88 0.99	Poor Low strength Shrink-swell	0.00 0.12	Poor Sodium content Salinity Too clayey	0.00 0.00 0.06
Dx: Durrstein-----	85	Poor Sodium content Too clayey Organic matter content low Salinity Water erosion	0.00 0.02 0.12 0.88 0.99	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.12	Poor Wetness depth Sodium content Salinity Too clayey	0.00 0.00 0.00 0.01

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ea: Eckman-----	85	Fair Water erosion	0.90	Good		Good	
EcA: Eckman-----	50	Fair Water erosion	0.90	Good		Good	
Gardena-----	40	Fair Water erosion	0.90	Good		Good	
EcB: Eckman-----	60	Fair Water erosion	0.90	Good		Good	
Gardena-----	30	Fair Water erosion	0.90	Good		Good	
EdB: Eckman-----	60	Fair Water erosion	0.90	Good		Good	
Zell-----	30	Fair Organic matter content low Carbonate content Water erosion	0.12 0.80 0.90	Good		Good	
EeB: Edgeley-----	85	Fair Droughty Depth to bedrock Water erosion	0.50 0.58 0.99	Poor Depth to bedrock Low strength Shrink-swell	0.00 0.00 0.99	Fair Depth to bedrock Rock fragments	0.58 0.97
EeC: Edgeley-----	85	Fair Droughty Depth to bedrock Water erosion	0.50 0.58 0.99	Poor Depth to bedrock Low strength Shrink-swell	0.00 0.00 0.99	Fair Depth to bedrock Rock fragments	0.58 0.97
EeD: Edgeley-----	85	Fair Droughty Depth to bedrock Water erosion	0.50 0.58 0.99	Poor Depth to bedrock Low strength Shrink-swell	0.00 0.00 0.99	Poor Slope Depth to bedrock Rock fragments	0.00 0.58 0.97
EgA: Egeland-----	50	Fair Organic matter content low	0.12	Good		Good	
Embden-----	40	Fair Organic matter content low	0.50	Good		Good	
EgB: Egeland-----	50	Fair Organic matter content low	0.12	Good		Good	

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
EgB: (cont.) Embden-----	35	Fair Organic matter content low	0.50	Good		Good	
Ek: Elsmere-----	85	Poor Wind erosion Too sandy Organic matter content low	0.00 0.14 0.88	Fair Low strength Wetness depth	0.22 0.76	Fair Too sandy Wetness depth	0.14 0.76
EmE: Ethan-----	50	Fair Organic matter content low Carbonate content Water erosion	0.12 0.68 0.99	Poor Slope Low strength Shrink-swell	0.00 0.00 0.87	Poor Slope Carbonate content	0.00 0.96
Betts-----	40	Fair Organic matter content low Carbonate content Water erosion	0.12 0.92 0.99	Poor Slope Low strength Shrink-swell	0.00 0.00 0.87	Poor Slope Carbonate content	0.00 0.97
EnD: Ethan-----	55	Fair Organic matter content low Carbonate content Water erosion	0.12 0.68 0.99	Poor Low strength Shrink-swell	0.00 0.87	Poor Slope Carbonate content	0.00 0.96
Hand-----	35	Fair Organic matter content low	0.12	Fair Shrink-swell	0.94	Fair Slope	0.37
Er: Exline-----	50	Poor Too clayey Sodium content Organic matter content low Salinity Water erosion	0.00 0.00 0.12 0.88 0.90	Poor Low strength Shrink-swell Wetness depth	0.00 0.39 0.91	Poor Too clayey Sodium content Salinity Wetness depth	0.00 0.00 0.00 0.91
Aberdeen-----	25	Fair Too clayey Organic matter content low Water erosion Sodium content	0.08 0.50 0.90 0.97	Poor Low strength Shrink-swell	0.00 0.81	Fair Too clayey Sodium content Salinity	0.06 0.22 0.88
Nahon-----	20	Fair Too clayey Organic matter content low Salinity Sodium content Water erosion	0.02 0.50 0.88 0.97 0.99	Poor Low strength Shrink-swell	0.00 0.34	Poor Salinity Too clayey Sodium content	0.00 0.01 0.22

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Et:							
Exline-----	50	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Sodium content	0.00	Shrink-swell	0.41	Sodium content	0.00
		Salinity	0.88	Wetness depth	0.91	Salinity	0.00
		Water erosion	0.90			Wetness depth	0.91
Aberdeen-----	25	Fair		Poor		Fair	
		Too clayey	0.08	Low strength	0.00	Too clayey	0.08
		Organic matter content low	0.12	Shrink-swell	0.49	Sodium content	0.22
		Water erosion	0.90			Salinity	0.88
		Sodium content	0.97				
Nahon-----	20	Fair		Poor		Poor	
		Too clayey	0.02	Low strength	0.00	Salinity	0.00
		Organic matter content low	0.50	Shrink-swell	0.34	Too clayey	0.01
		Salinity	0.88			Sodium content	0.22
		Sodium content	0.97				
		Water erosion	0.99				
Ew:							
Exline-----	50	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Sodium content	0.00	Shrink-swell	0.39	Sodium content	0.00
		Organic matter content low	0.12	Wetness depth	0.91	Salinity	0.00
		Salinity	0.88			Wetness depth	0.91
		Water erosion	0.90				
Heil-----	40	Poor		Poor		Poor	
		Too clayey	0.00	Wetness depth	0.00	Too clayey	0.00
		Sodium content	0.00	Low strength	0.00	Wetness depth	0.00
		Organic matter content low	0.12	Shrink-swell	0.12	Sodium content	0.00
		Salinity	0.88			Salinity	0.00
		Water erosion	0.99				
Ex:							
Exline-----	50	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Sodium content	0.00	Shrink-swell	0.41	Sodium content	0.00
		Salinity	0.88	Wetness depth	0.91	Salinity	0.00
		Water erosion	0.90			Wetness depth	0.91
Heil-----	40	Poor		Poor		Poor	
		Too clayey	0.00	Wetness depth	0.00	Too clayey	0.00
		Sodium content	0.00	Low strength	0.00	Wetness depth	0.00
		Organic matter content low	0.12	Shrink-swell	0.12	Sodium content	0.00
		Salinity	0.88			Salinity	0.00
		Water erosion	0.99				

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
EyA: Exline-----	45	Poor Too clayey Sodium content Organic matter content low Salinity Water erosion	0.00 0.00 0.12 0.88 0.90	Poor Low strength Shrink-swell	0.00 0.39	Poor Too clayey Sodium content Salinity	0.00 0.00 0.00
Putney-----	40	Fair Salinity Carbonate content Water erosion	0.50 0.68 0.90	Poor Low strength Shrink-swell	0.00 0.99	Poor Salinity	0.00
Fa: Farmsworth-----	50	Poor Sodium content Too clayey Organic matter content low Salinity Water erosion Carbonate content	0.00 0.02 0.12 0.88 0.99 0.99	Fair Shrink-swell Wetness depth	0.34 0.76	Poor Sodium content Salinity Too clayey Wetness depth	0.00 0.00 0.02 0.76
Durrstein-----	35	Poor Sodium content Too clayey Organic matter content low Salinity Water erosion	0.00 0.02 0.12 0.88 0.99	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.12	Poor Wetness depth Sodium content Salinity Too clayey	0.00 0.00 0.00 0.01
Fe: Ferney-----	50	Poor Sodium content Too clayey Organic matter content low Salinity Carbonate content	0.00 0.08 0.50 0.88 0.97	Poor Low strength Shrink-swell Wetness depth	0.00 0.12 0.91	Poor Sodium content Salinity Too clayey Wetness depth	0.00 0.00 0.05 0.91
Heil-----	40	Poor Too clayey Sodium content Organic matter content low Salinity Water erosion	0.00 0.00 0.12 0.88 0.99	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.12	Poor Too clayey Wetness depth Sodium content Salinity	0.00 0.00 0.00 0.00
Ff: Forestburg-----	60	Poor Wind erosion Too sandy Organic matter content low Water erosion	0.00 0.02 0.88 0.99	Good		Fair Too sandy	0.02

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ff: (cont.) Elsmere-----	30	Poor Wind erosion Too sandy Organic matter content low	0.00 0.14 0.88	Fair Low strength Wetness depth	0.22 0.53	Fair Too sandy Wetness depth	0.14 0.53
Fh: Forestburg-----	45	Poor Wind erosion Too sandy Organic matter content low Water erosion	0.00 0.02 0.88 0.99	Good		Fair Too sandy	0.02
Elsmere-----	25	Poor Wind erosion Too sandy Organic matter content low	0.00 0.14 0.88	Fair Low strength Wetness depth	0.22 0.53	Fair Too sandy Wetness depth	0.14 0.53
Toko-----	20	Fair Organic matter content low	0.12	Poor Wetness depth	0.00	Poor Wetness depth	0.00
FmA: Forman-----	50	Fair Organic matter content low Carbonate content Water erosion	0.12 0.97 0.99	Fair Low strength Shrink-swell	0.22 0.87	Good	
Aastad-----	40	Fair Organic matter content low Too clayey Carbonate content Water erosion	0.12 0.95 0.97 0.99	Poor Low strength Shrink-swell	0.00 0.87	Fair Too clayey	0.95
FmB: Forman-----	60	Fair Organic matter content low Carbonate content Water erosion	0.12 0.97 0.99	Fair Low strength Shrink-swell	0.22 0.87	Good	
Aastad-----	30	Fair Organic matter content low Too clayey Carbonate content Water erosion	0.12 0.95 0.97 0.99	Poor Low strength Shrink-swell	0.00 0.87	Fair Too clayey	0.95
FnC: Forman-----	55	Fair Organic matter content low Carbonate content Water erosion	0.12 0.97 0.99	Fair Low strength Shrink-swell	0.22 0.87	Good	

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FnC: (cont.) Buse-----	35	Fair Organic matter content low Carbonate content Water erosion	0.12 0.46 0.99	Fair Low strength Shrink-swell	0.22 0.87	Fair Carbonate content	0.76
FrB: Forman-----	50	Fair Organic matter content low Carbonate content Water erosion	0.12 0.97 0.99	Fair Low strength Shrink-swell	0.22 0.87	Good	
Buse-----	25	Fair Organic matter content low Carbonate content Water erosion	0.12 0.46 0.99	Fair Low strength Shrink-swell	0.22 0.87	Fair Carbonate content	0.76
Aastad-----	20	Fair Organic matter content low Too clayey Carbonate content Water erosion	0.12 0.95 0.97 0.99	Poor Low strength Shrink-swell	0.00 0.87	Fair Too clayey	0.95
FrC: Forman-----	45	Fair Organic matter content low Carbonate content Water erosion	0.12 0.97 0.99	Fair Low strength Shrink-swell	0.22 0.87	Good	
Buse-----	30	Fair Organic matter content low Carbonate content Water erosion	0.12 0.46 0.99	Fair Low strength Shrink-swell	0.22 0.87	Fair Carbonate content	0.76
Aastad-----	20	Fair Organic matter content low Too clayey Carbonate content Water erosion	0.12 0.95 0.97 0.99	Poor Low strength Shrink-swell	0.00 0.87	Fair Too clayey	0.95
FsA: Forman-----	55	Fair Organic matter content low Carbonate content Water erosion	0.12 0.97 0.99	Fair Low strength Shrink-swell	0.22 0.87	Good	
Cresbard-----	30	Fair Too clayey Organic matter content low Sodium content Water erosion	0.08 0.12 0.90 0.99	Poor Low strength Shrink-swell	0.00 0.45	Fair Too clayey Sodium content	0.05 0.22

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FsB:							
Forman-----	60	Fair		Fair		Good	
		Organic matter content low	0.12	Low strength	0.22		
		Carbonate content	0.97	Shrink-swell	0.87		
		Water erosion	0.99				
Cresbard-----	30	Fair		Poor		Fair	
		Too clayey	0.08	Low strength	0.00	Too clayey	0.05
		Organic matter content low	0.12	Shrink-swell	0.45	Sodium content	0.22
		Sodium content	0.90				
		Water erosion	0.99				
FtA:							
Forman-----	45	Fair		Fair		Good	
		Organic matter content low	0.12	Low strength	0.22		
		Carbonate content	0.97	Shrink-swell	0.87		
		Water erosion	0.99				
Cresbard-----	25	Fair		Poor		Fair	
		Too clayey	0.08	Low strength	0.00	Too clayey	0.05
		Organic matter content low	0.12	Shrink-swell	0.45	Sodium content	0.22
		Sodium content	0.90				
		Water erosion	0.99				
Tonka-----	20	Poor		Poor		Poor	
		Too clayey	0.00	Wetness depth	0.00	Wetness depth	0.00
		Organic matter content low	0.50	Low strength	0.00	Too clayey	0.00
		Water erosion	0.90	Shrink-swell	0.61		
Ga:							
Gardena-----	90	Fair		Good		Good	
		Water erosion	0.90				
Gd:							
Gardena-----	55	Fair		Good		Good	
		Water erosion	0.90				
Glyndon-----	35	Fair		Good		Fair	
		Carbonate content	0.32			Carbonate content	0.54
		Water erosion	0.90				
Ge:							
Gardena-----	50	Fair		Good		Good	
		Water erosion	0.90				
Turton-----	35	Poor		Fair		Poor	
		Sodium content	0.00	Shrink-swell	0.99	Salinity	0.00
		Too alkaline	0.00			Sodium content	0.22
		Organic matter content low	0.12				
		Salinity	0.88				
		Water erosion	0.90				
		Carbonate content	0.92				

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GgA: Great Bend-----	90	Fair Organic matter content low Water erosion Carbonate content	0.12 0.90 0.97	Poor Low strength	0.00	Good	
GnA: Great Bend-----	50	Fair Organic matter content low Water erosion Carbonate content	0.12 0.90 0.97	Poor Low strength	0.00	Good	
Beotia-----	40	Fair Organic matter content low Water erosion Carbonate content	0.12 0.90 0.92	Poor Low strength Shrink-swell	0.00 0.87	Good	
GnB: Great Bend-----	60	Fair Organic matter content low Water erosion Carbonate content	0.12 0.90 0.97	Poor Low strength	0.00	Good	
Beotia-----	30	Fair Organic matter content low Water erosion Carbonate content	0.12 0.90 0.92	Poor Low strength Shrink-swell	0.00 0.87	Good	
GoA: Great Bend-----	50	Fair Organic matter content low Water erosion Carbonate content	0.12 0.90 0.92	Poor Low strength	0.00	Good	
Beotia-----	40	Fair Carbonate content Water erosion	0.92 0.99	Poor Low strength Shrink-swell	0.00 0.89	Good	
GpA: Great Bend-----	50	Fair Organic matter content low Water erosion Carbonate content	0.12 0.90 0.97	Poor Low strength	0.00	Good	
Putney-----	35	Fair Salinity Carbonate content Water erosion	0.50 0.68 0.90	Poor Low strength Shrink-swell	0.00 0.99	Poor Salinity	0.00

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GpB: Great Bend-----	50	Fair Organic matter content low Water erosion Carbonate content	0.12 0.90 0.97	Poor Low strength	0.00	Good	
Putney-----	35	Fair Salinity Carbonate content Water erosion	0.50 0.68 0.90	Poor Low strength Shrink-swell	0.00 0.99	Poor Salinity	0.00
GtB: Great Bend-----	60	Fair Organic matter content low Water erosion Carbonate content	0.12 0.90 0.97	Poor Low strength	0.00	Good	
Zell-----	30	Fair Organic matter content low Carbonate content Water erosion	0.12 0.80 0.90	Good		Fair	
GtC: Great Bend-----	50	Fair Organic matter content low Water erosion Carbonate content	0.12 0.90 0.97	Poor Low strength	0.00	Good	
Zell-----	40	Fair Organic matter content low Carbonate content Water erosion	0.12 0.80 0.90	Good		Fair	
GzC: Great Bend-----	45	Fair Organic matter content low Water erosion Carbonate content	0.12 0.90 0.97	Poor Low strength	0.00	Good	
Zell-----	25	Fair Organic matter content low Carbonate content Water erosion	0.12 0.80 0.90	Good		Fair	
Huffton-----	20	Fair Organic matter content low Carbonate content Salinity Water erosion Sodium content	0.12 0.46 0.88 0.90 0.90	Poor Low strength	0.00	Poor Salinity Sodium content Carbonate content	0.00 0.90 0.98

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HaA: Hamerly-----	85	Fair Organic matter content low Carbonate content Water erosion	0.12 0.68 0.99	Fair Low strength Shrink-swell Wetness depth	0.22 0.87 0.91	Fair Wetness depth	0.91
Hb: Hamerly-----	50	Fair Organic matter content low Carbonate content Water erosion	0.12 0.68 0.99	Fair Low strength Shrink-swell Wetness depth	0.22 0.87 0.91	Fair Wetness depth	0.91
Tonka-----	40	Poor Too clayey Organic matter content low Water erosion	0.00 0.50 0.90	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.61	Poor Wetness depth Too clayey	0.00 0.00
HcA: Hand-----	50	Fair Organic matter content low	0.12	Fair Shrink-swell	0.94	Good	
Bonilla-----	40	Fair Organic matter content low	0.12	Poor Low strength Shrink-swell	0.00 0.87	Good	
HcB: Hand-----	60	Fair Organic matter content low	0.12	Fair Shrink-swell	0.94	Good	
Bonilla-----	30	Fair Organic matter content low	0.12	Poor Low strength Shrink-swell	0.00 0.87	Good	
HdA: Hand-----	50	Fair Organic matter content low	0.12	Fair Shrink-swell	0.94	Good	
Carthage-----	40	Fair Organic matter content low Water erosion	0.12 0.99	Poor Low strength Shrink-swell	0.00 0.98	Good	
He: Hand-----	45	Fair Organic matter content low	0.12	Fair Shrink-swell	0.94	Good	
Carthage-----	25	Fair Organic matter content low Water erosion	0.12 0.99	Poor Low strength Shrink-swell	0.00 0.98	Good	

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
He: (cont.) Overshue-----	20	Good		Poor Wetness depth Low strength	0.00 0.22	Poor Wetness depth	0.00
HfC: Hand-----	55	Fair Organic matter content low	0.12	Fair Shrink-swell	0.94	Good	
Ethan-----	35	Fair Organic matter content low Carbonate content Water erosion	0.12 0.68 0.99	Poor Low strength Shrink-swell	0.00 0.87	Fair Carbonate content	0.96
HgB: Hand-----	50	Fair Organic matter content low	0.12	Fair Shrink-swell	0.94	Good	
Ethan-----	25	Fair Organic matter content low Carbonate content Water erosion	0.12 0.68 0.99	Poor Low strength Shrink-swell	0.00 0.87	Fair Carbonate content	0.96
Bonilla-----	20	Fair Organic matter content low	0.12	Poor Low strength Shrink-swell	0.00 0.87	Good	
HgC: Hand-----	45	Fair Organic matter content low	0.12	Fair Shrink-swell	0.94	Good	
Ethan-----	30	Fair Organic matter content low Carbonate content Water erosion	0.12 0.68 0.99	Poor Low strength Shrink-swell	0.00 0.87	Fair Carbonate content	0.96
Bonilla-----	20	Fair Organic matter content low	0.12	Poor Low strength Shrink-swell	0.00 0.87	Good	
HhB: Hand-----	50	Fair Organic matter content low	0.12	Fair Shrink-swell	0.94	Good	
Ethan-----	25	Fair Organic matter content low Carbonate content Water erosion	0.12 0.68 0.99	Poor Low strength Shrink-swell	0.00 0.87	Fair Carbonate content	0.96

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HhB: (cont.) Carthage-----	20	Fair Organic matter content low Water erosion	0.12 0.99	Poor Low strength Shrink-swell	0.00 0.98	Good	
HjB: Hand-----	45	Fair Organic matter content low	0.12	Fair Shrink-swell	0.94	Good	
Talmo-----	35	Fair Organic matter content low Too sandy Droughty	0.12 0.30 0.81	Good		Poor Rock fragments Hard to reclaim (rock fragments) Too sandy	0.00 0.00 0.30
HjC: Hand-----	45	Fair Organic matter content low	0.12	Fair Shrink-swell	0.94	Good	
Talmo-----	35	Fair Organic matter content low Too sandy Droughty	0.12 0.30 0.81	Good		Poor Rock fragments Hard to reclaim (rock fragments) Too sandy	0.00 0.00 0.30
Hk: Harmony-----	55	Poor Too clayey Water erosion Carbonate content	0.00 0.90 0.97	Poor Low strength Shrink-swell	0.00 0.51	Poor Too clayey	0.00
Aberdeen-----	35	Fair Too clayey Organic matter content low Water erosion Sodium content	0.08 0.12 0.90 0.97	Poor Low strength Shrink-swell	0.00 0.49	Fair Too clayey Sodium content Salinity	0.08 0.22 0.88
Hm: Harmony-----	55	Poor Too clayey Organic matter content low Water erosion Carbonate content	0.00 0.12 0.90 0.97	Poor Low strength Shrink-swell	0.00 0.69	Poor Too clayey	0.00
Aberdeen-----	35	Fair Too clayey Organic matter content low Water erosion Sodium content	0.08 0.50 0.90 0.97	Poor Low strength Shrink-swell	0.00 0.81	Fair Too clayey Sodium content Salinity	0.06 0.22 0.88

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Hn: Harmony-----	55	Poor Too clayey Organic matter content low Water erosion Carbonate content	0.00 0.12 0.90 0.97	Poor Low strength Shrink-swell	0.00 0.71	Poor Too clayey	0.00
Beotia-----	35	Fair Organic matter content low Water erosion Carbonate content	0.12 0.90 0.92	Poor Low strength Shrink-swell	0.00 0.87	Good	
Ho: Harmony-----	55	Poor Too clayey Water erosion Carbonate content	0.00 0.90 0.97	Poor Low strength Shrink-swell	0.00 0.51	Poor Too clayey	0.00
Beotia-----	35	Fair Carbonate content Water erosion	0.92 0.99	Poor Low strength Shrink-swell	0.00 0.89	Good	
Hp: Harriet-----	90	Poor Sodium content Organic matter content low Carbonate content Salinity Water erosion	0.00 0.12 0.46 0.88 0.99	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.79	Poor Wetness depth Sodium content Salinity	0.00 0.00 0.00
Hr: Heil-----	90	Poor Too clayey Sodium content Organic matter content low Salinity Water erosion	0.00 0.00 0.12 0.88 0.99	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.12	Poor Too clayey Wetness depth Sodium content Salinity	0.00 0.00 0.00 0.00
HsA: Henkin-----	55	Good		Good		Good	
Blendon-----	35	Good		Good		Good	
HsB: Henkin-----	60	Good		Good		Good	
Blendon-----	30	Good		Good		Good	
HtB: Houdek-----	50	Fair Organic matter content low Carbonate content	0.12 0.97	Poor Low strength Shrink-swell	0.00 0.87	Good	

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HtB: (cont.)							
Ethan-----	25	Fair Organic matter content low Carbonate content Water erosion	0.12 0.68 0.99	Poor Low strength Shrink-swell	0.00 0.87	Fair Carbonate content	0.96
Prosper-----	20	Fair Organic matter content low Too clayey Water erosion	0.12 0.98 0.99	Poor Low strength Shrink-swell	0.00 0.87	Fair Too clayey	0.93
HtC:							
Houdek-----	45	Fair Organic matter content low Carbonate content	0.12 0.97	Poor Low strength Shrink-swell	0.00 0.87	Good	
Ethan-----	30	Fair Organic matter content low Carbonate content Water erosion	0.12 0.68 0.99	Poor Low strength Shrink-swell	0.00 0.87	Fair Carbonate content	0.96
Prosper-----	20	Fair Organic matter content low Too clayey Water erosion	0.12 0.98 0.99	Poor Low strength Shrink-swell	0.00 0.87	Fair Too clayey	0.93
HuA:							
Houdek-----	50	Fair Organic matter content low Carbonate content	0.12 0.97	Poor Low strength Shrink-swell	0.00 0.87	Good	
Prosper-----	40	Fair Organic matter content low Too clayey Water erosion	0.12 0.98 0.99	Poor Low strength Shrink-swell	0.00 0.87	Fair Too clayey	0.93
HuB:							
Houdek-----	60	Fair Organic matter content low Carbonate content	0.12 0.97	Poor Low strength Shrink-swell	0.00 0.87	Good	
Prosper-----	30	Fair Organic matter content low Too clayey Water erosion	0.12 0.98 0.99	Poor Low strength Shrink-swell	0.00 0.87	Fair Too clayey	0.93
HwA:							
Houdek-----	55	Fair Organic matter content low Carbonate content	0.12 0.97	Poor Low strength Shrink-swell	0.00 0.87	Good	

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HwA: (cont.) Stickney-----	35	Fair Sodium content Organic matter content low Salinity Water erosion	 0.22 0.50 0.88 0.99	Poor Low strength Shrink-swell	 0.00 0.72	Poor Salinity Sodium content	 0.00 0.22
HxA: Houdek-----	45	Fair Organic matter content low Carbonate content	 0.12 0.97	Poor Low strength Shrink-swell	 0.00 0.87	Good	
Stickney-----	25	Fair Sodium content Organic matter content low Salinity Water erosion	 0.22 0.50 0.88 0.99	Poor Low strength Shrink-swell	 0.00 0.72	Poor Salinity Sodium content	 0.00 0.22
Tetonka-----	20	Poor Too clayey Organic matter content low Water erosion	 0.00 0.50 0.99	Poor Wetness depth Low strength Shrink-swell	 0.00 0.00 0.16	Poor Wetness depth Too clayey	 0.00 0.00
Hy: Hoven-----	90	Poor Sodium content Too clayey Organic matter content low Salinity Water erosion	 0.00 0.02 0.50 0.88 0.99	Poor Wetness depth Low strength Shrink-swell	 0.00 0.00 0.12	Poor Wetness depth Sodium content Salinity Too clayey	 0.00 0.00 0.00 0.01
Ie: Ipage-----	45	Poor Too sandy Wind erosion Organic matter content low Too acid	 0.00 0.00 0.50 0.97	Good		Poor Too sandy	 0.00
Els-----	25	Poor Too sandy Wind erosion Organic matter content low	 0.00 0.00 0.12	Fair Wetness depth	 0.76	Poor Too sandy Wetness depth	 0.00 0.76
Shue-----	20	Poor Too sandy Wind erosion Organic matter content low Water erosion	 0.00 0.00 0.12 0.99	Poor Wetness depth Low strength Shrink-swell	 0.00 0.78 0.98	Poor Too sandy Wetness depth	 0.00 0.00

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Jh:							
Jerauld-----	50	Poor		Poor		Poor	
		Sodium content	0.00	Low strength	0.00	Sodium content	0.00
		Too clayey	0.08	Shrink-swell	0.12	Salinity	0.00
		Organic matter content low	0.12	Wetness depth	0.91	Too clayey	0.06
		Salinity	0.88			Wetness depth	0.91
		Water erosion	0.99				
Hoven-----	40	Poor		Poor		Poor	
		Sodium content	0.00	Wetness depth	0.00	Wetness depth	0.00
		Too clayey	0.02	Low strength	0.00	Sodium content	0.00
		Organic matter content low	0.50	Shrink-swell	0.12	Salinity	0.00
		Salinity	0.88			Too clayey	0.01
		Water erosion	0.99				
KaA:							
Kranzburg-----	50	Fair		Poor		Good	
		Organic matter content low	0.50	Low strength	0.00		
		Carbonate content	0.92	Shrink-swell	0.87		
		Water erosion	0.99				
Brookings-----	40	Fair		Poor		Good	
		Organic matter content low	0.50	Low strength	0.00		
		Water erosion	0.99	Shrink-swell	0.92		
KbB:							
Kranzburg-----	40	Fair		Poor		Good	
		Organic matter content low	0.50	Low strength	0.00		
		Carbonate content	0.92	Shrink-swell	0.87		
		Water erosion	0.99				
Brookings-----	30	Fair		Poor		Good	
		Organic matter content low	0.50	Low strength	0.00		
		Water erosion	0.99	Shrink-swell	0.92		
Buse-----	25	Fair		Fair		Fair	
		Organic matter content low	0.12	Low strength	0.22	Carbonate content	0.76
		Carbonate content	0.46	Shrink-swell	0.87		
		Water erosion	0.99				
KcA:							
Kranzburg-----	55	Fair		Poor		Good	
		Organic matter content low	0.50	Low strength	0.00		
		Carbonate content	0.92	Shrink-swell	0.87		
		Water erosion	0.99				
Cresbard-----	30	Fair		Poor		Fair	
		Too clayey	0.08	Low strength	0.00	Too clayey	0.05
		Organic matter content low	0.12	Shrink-swell	0.45	Sodium content	0.22
		Sodium content	0.90				
		Water erosion	0.99				

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KtA:							
Kranzburg-----	45	Fair		Poor		Good	
		Organic matter	0.50	Low strength	0.00		
		content low		Shrink-swell	0.87		
		Carbonate content	0.92				
		Water erosion	0.99				
Cresbard-----	25	Fair		Poor		Fair	
		Too clayey	0.08	Low strength	0.00	Too clayey	0.05
		Organic matter	0.12	Shrink-swell	0.45	Sodium content	0.22
		content low					
		Sodium content	0.90				
		Water erosion	0.99				
Tonka-----	20	Poor		Poor		Poor	
		Too clayey	0.00	Wetness depth	0.00	Wetness depth	0.00
		Organic matter	0.50	Low strength	0.00	Too clayey	0.00
		content low		Shrink-swell	0.61		
		Water erosion	0.90				
KzB:							
Kranzburg-----	40	Fair		Poor		Good	
		Organic matter	0.50	Low strength	0.00		
		content low		Shrink-swell	0.87		
		Carbonate content	0.92				
		Water erosion	0.99				
Zell-----	30	Fair		Good		Fair	
		Organic matter	0.12				
		content low					
		Carbonate content	0.80				
		Water erosion	0.90				
Aastad-----	20	Fair		Poor		Fair	
		Organic matter	0.12	Low strength	0.00	Too clayey	0.95
		content low		Shrink-swell	0.87		
		Too clayey	0.95				
		Carbonate content	0.97				
		Water erosion	0.99				
La:							
La Prairie, channeled-----	85	Fair		Poor		Good	
		Carbonate content	0.92	Low strength	0.00		
				Shrink-swell	0.90		
Lc:							
La Prairie, channeled-----	50	Fair		Poor		Good	
		Carbonate content	0.92	Low strength	0.00		
				Shrink-swell	0.90		
Holmquist-----	40	Fair		Poor		Poor	
		Organic matter	0.12	Wetness depth	0.00	Wetness depth	0.00
		content low		Low strength	0.78	Salinity	0.50
		Sodium content	0.60	Shrink-swell	0.87	Sodium content	0.60
Ld:							
LaDelle-----	90	Good		Poor		Good	
				Low strength	0.00		
				Shrink-swell	0.95		

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Le: LaDelle, channeled--	85	Good		Poor Low strength Shrink-swell	0.00 0.95	Good	
Lk: Lamo-----	90	Fair Organic matter content low Water erosion	0.88 0.90	Poor Low strength Wetness depth Shrink-swell	0.00 0.53 0.87	Fair Wetness depth	0.53
Lm: Lamoure-----	85	Fair Water erosion	0.90	Poor Low strength Wetness depth Shrink-swell	0.00 0.00 0.91	Poor Wetness depth	0.00
Ln: Lawet-----	85	Fair Carbonate content	0.68	Fair Wetness depth Shrink-swell	0.14 0.94	Fair Wetness depth Carbonate content	0.14 0.82
Lo: Lawet, wet-----	90	Fair Carbonate content	0.68	Poor Wetness depth Shrink-swell	0.00 0.94	Poor Wetness depth Carbonate content	0.00 0.82
Lp: Lawet-----	60	Fair Carbonate content	0.68	Fair Wetness depth Shrink-swell	0.14 0.94	Fair Wetness depth Carbonate content	0.14 0.82
Davison-----	30	Fair Organic matter content low Carbonate content Water erosion	0.50 0.80 0.99	Fair Shrink-swell Wetness depth	0.93 0.98	Fair Carbonate content Wetness depth	0.97 0.98
LrA: Lehr-----	55	Fair Too sandy Organic matter content low Droughty	0.30 0.50 0.86	Good		Poor Rock fragments Hard to reclaim (rock fragments) Too sandy	0.00 0.00 0.30
Bowdle-----	35	Fair Organic matter content low	0.12	Good		Fair Hard to reclaim (rock fragments)	0.82
LrB: Lehr-----	60	Fair Too sandy Organic matter content low Droughty	0.30 0.50 0.86	Good		Poor Rock fragments Hard to reclaim (rock fragments) Too sandy	0.00 0.00 0.30
Bowdle-----	30	Fair Organic matter content low	0.12	Good		Fair Hard to reclaim (rock fragments)	0.82

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ls:							
Lowe-----	85	Fair		Poor		Poor	
		Organic matter content low	0.50	Wetness depth	0.00	Wetness depth	0.00
		Carbonate content	0.68	Shrink-swell	0.87	Carbonate content	0.96
Lt:							
Ludden-----	85	Poor		Poor		Poor	
		Too clayey	0.00	Wetness depth	0.00	Too clayey	0.00
		Organic matter content low	0.12	Low strength	0.00	Wetness depth	0.00
				Shrink-swell	0.12		
Lu:							
Ludden, ponded-----	90	Poor		Poor		Poor	
		Too clayey	0.00	Wetness depth	0.00	Too clayey	0.00
		Organic matter content low	0.12	Low strength	0.00	Wetness depth	0.00
				Shrink-swell	0.12		
Lw:							
Ludden, wet-----	85	Poor		Poor		Poor	
		Too clayey	0.00	Wetness depth	0.00	Too clayey	0.00
		Organic matter content low	0.12	Low strength	0.00	Wetness depth	0.00
				Shrink-swell	0.12		
M-W:							
Miscellaneous water-	100	Not rated		Not rated		Not rated	
MaC:							
Maddock-----	50	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Organic matter content low	0.88				
Egeland-----	35	Fair		Good		Good	
		Organic matter content low	0.12				
MdA:							
Max-----	50	Fair		Fair		Good	
		Organic matter content low	0.50	Low strength	0.22		
		Carbonate content	0.92	Shrink-swell	0.91		
		Water erosion	0.99				
Arnegard-----	40	Fair		Good		Good	
		Organic matter content low	0.50				
MdB:							
Max-----	60	Fair		Fair		Good	
		Organic matter content low	0.50	Low strength	0.22		
		Carbonate content	0.92	Shrink-swell	0.91		
		Water erosion	0.99				
Arnegard-----	30	Fair		Good		Good	
		Organic matter content low	0.50				

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MgB: Max-----	45	Fair Organic matter content low Carbonate content Water erosion	0.50 0.92 0.99	Fair Low strength Shrink-swell	0.22 0.91	Good	
Arnegard-----	30	Fair Organic matter content low	0.50	Good		Good	
Zahl-----	20	Fair Organic matter content low Carbonate content Water erosion	0.12 0.92 0.99	Poor Low strength Shrink-swell	0.00 0.87	Good	
MnB: Max-----	40	Fair Organic matter content low Carbonate content Water erosion	0.50 0.92 0.99	Fair Low strength Shrink-swell	0.22 0.91	Good	
Niobell-----	30	Fair Sodium content Too clayey Organic matter content low Water erosion	0.22 0.32 0.50 0.99	Fair Shrink-swell	0.69	Fair Sodium content Too clayey	0.22 0.30
Noonan-----	20	Fair Organic matter content low Sodium content Carbonate content Water erosion	0.12 0.22 0.92 0.99	Poor Low strength Shrink-swell	0.00 0.78	Fair Sodium content Salinity	0.60 0.88
MxC: Max-----	45	Fair Organic matter content low Carbonate content Water erosion	0.50 0.92 0.99	Fair Low strength Shrink-swell	0.22 0.91	Good	
Zahl-----	30	Fair Organic matter content low Carbonate content Water erosion	0.12 0.92 0.99	Poor Low strength Shrink-swell	0.00 0.87	Good	
Arnegard-----	20	Fair Organic matter content low	0.50	Good		Good	

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
My: Miranda-----	50	Poor Sodium content Organic matter content low Salinity Carbonate content	0.00 0.12 0.88 0.97	Poor Low strength Shrink-swell Wetness depth	0.00 0.84 0.91	Poor Sodium content Salinity Wetness depth	0.00 0.00 0.91
Heil-----	40	Poor Too clayey Sodium content Organic matter content low Salinity Water erosion	0.00 0.00 0.12 0.88 0.99	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.12	Poor Too clayey Wetness depth Sodium content Salinity	0.00 0.00 0.00 0.00
Mz: Moritz-----	55	Fair Carbonate content	0.92	Fair Wetness depth Shrink-swell	0.76 0.99	Fair Wetness depth No carbonate limitation	0.76 0.99
Lowe-----	35	Fair Organic matter content low Carbonate content	0.50 0.68	Poor Wetness depth Shrink-swell	0.00 0.87	Poor Wetness depth Carbonate content	0.00 0.96
Na: Nahon-----	45	Fair Too clayey Organic matter content low Salinity Sodium content Water erosion	0.02 0.50 0.88 0.97 0.99	Poor Low strength Shrink-swell	0.00 0.34	Poor Salinity Too clayey Sodium content	0.00 0.01 0.22
Aberdeen-----	30	Fair Too clayey Organic matter content low Water erosion Sodium content	0.08 0.50 0.90 0.97	Poor Low strength Shrink-swell	0.00 0.81	Fair Too clayey Sodium content Salinity	0.06 0.22 0.88
Exline-----	20	Poor Too clayey Sodium content Organic matter content low Salinity Water erosion	0.00 0.00 0.12 0.88 0.90	Poor Low strength Shrink-swell Wetness depth	0.00 0.39 0.91	Poor Too clayey Sodium content Salinity Wetness depth	0.00 0.00 0.00 0.91
Nb: Nahon-----	45	Fair Too clayey Organic matter content low Salinity Sodium content Water erosion	0.02 0.50 0.88 0.97 0.99	Poor Low strength Shrink-swell	0.00 0.34	Poor Salinity Too clayey Sodium content	0.00 0.01 0.22

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Nb: (cont.) Aberdeen-----	30	Fair Too clayey Organic matter content low Water erosion Sodium content	0.08 0.12 0.90 0.97	Poor Low strength Shrink-swell	0.00 0.49	Fair Too clayey Sodium content Salinity	0.08 0.22 0.88
Exline-----	20	Poor Too clayey Sodium content Salinity Water erosion	0.00 0.00 0.88 0.90	Poor Low strength Shrink-swell Wetness depth	0.00 0.41 0.91	Poor Too clayey Sodium content Salinity Wetness depth	0.00 0.00 0.00 0.91
Nc: Niobell-----	60	Fair Sodium content Too clayey Organic matter content low Water erosion	0.22 0.32 0.50 0.99	Fair Shrink-swell	0.69	Fair Sodium content Too clayey	0.22 0.30
Noonan-----	30	Fair Organic matter content low Sodium content Carbonate content Water erosion	0.12 0.22 0.92 0.99	Poor Low strength Shrink-swell	0.00 0.78	Fair Sodium content Salinity	0.60 0.88
Nd: Niobell-----	40	Fair Sodium content Too clayey Organic matter content low Water erosion	0.22 0.32 0.50 0.99	Fair Shrink-swell	0.69	Fair Sodium content Too clayey	0.22 0.30
Noonan-----	30	Fair Organic matter content low Sodium content Carbonate content Water erosion	0.12 0.22 0.92 0.99	Poor Low strength Shrink-swell	0.00 0.78	Fair Sodium content Salinity	0.60 0.88
Heil-----	20	Poor Too clayey Sodium content Organic matter content low Salinity Water erosion	0.00 0.00 0.12 0.88 0.99	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.12	Poor Too clayey Wetness depth Sodium content Salinity	0.00 0.00 0.00 0.00
NeA: Niobell-----	40	Fair Sodium content Too clayey Organic matter content low Water erosion	0.22 0.32 0.50 0.99	Fair Shrink-swell	0.69	Fair Sodium content Too clayey	0.22 0.30

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
NeA: (cont.) Noonan-----	30	Fair Organic matter content low Sodium content Carbonate content Water erosion	0.12 0.22 0.92 0.99	Poor Low strength Shrink-swell	0.00 0.78	Fair Sodium content Salinity	0.60 0.88
Max-----	20	Fair Organic matter content low Carbonate content Water erosion	0.50 0.92 0.99	Fair Low strength Shrink-swell	0.22 0.91	Good	
Nm: Noonan-----	55	Fair Organic matter content low Sodium content Carbonate content Water erosion	0.12 0.22 0.92 0.99	Poor Low strength Shrink-swell	0.00 0.78	Fair Sodium content Salinity	0.60 0.88
Miranda-----	35	Poor Sodium content Organic matter content low Salinity Carbonate content	0.00 0.12 0.88 0.97	Poor Low strength Shrink-swell	0.00 0.84	Poor Sodium content Salinity	0.00 0.00
Nr: Northville-----	60	Fair Sodium content Too clayey Salinity Water erosion	0.22 0.50 0.88 0.99	Poor Low strength Shrink-swell	0.00 0.72	Poor Salinity Sodium content Too clayey	0.00 0.22 0.41
Farmsworth-----	30	Poor Sodium content Too clayey Organic matter content low Salinity Water erosion Carbonate content	0.00 0.02 0.12 0.88 0.99 0.99	Fair Shrink-swell Wetness depth	0.34 0.76	Poor Sodium content Salinity Too clayey Wetness depth	0.00 0.00 0.02 0.76
Nv: Northville-----	40	Fair Sodium content Too clayey Salinity Water erosion	0.22 0.50 0.88 0.99	Poor Low strength Shrink-swell	0.00 0.72	Poor Salinity Sodium content Too clayey	0.00 0.22 0.41
Farmsworth-----	30	Poor Sodium content Too clayey Organic matter content low Salinity Water erosion Carbonate content	0.00 0.02 0.12 0.88 0.99 0.99	Fair Shrink-swell Wetness depth	0.34 0.76	Poor Sodium content Salinity Too clayey Wetness depth	0.00 0.00 0.02 0.76

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Nv: (cont.) Hoven-----	20	Poor Sodium content Too clayey Organic matter content low Salinity Water erosion	0.00 0.02 0.50 0.88 0.99	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.12	Poor Wetness depth Sodium content Salinity Too clayey	0.00 0.00 0.00 0.01
Ov: Overshue-----	90	Good		Poor Wetness depth Low strength	0.00 0.22	Poor Wetness depth	0.00
Pa: Parnell-----	90	Poor Too clayey Water erosion	0.00 0.99	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.14	Poor Wetness depth Too clayey	0.00 0.00
Pc: Parshall-----	85	Fair Organic matter content low	0.50	Good		Good	
PeA: Peever-----	85	Fair Organic matter content low Too clayey Sodium content Water erosion	0.12 0.12 0.97 0.99	Poor Low strength Shrink-swell	0.00 0.12	Fair Too clayey Sodium content	0.08 0.98
PgB: Peever-----	60	Fair Organic matter content low Too clayey Sodium content Water erosion	0.12 0.12 0.97 0.99	Poor Low strength Shrink-swell	0.00 0.12	Fair Too clayey Sodium content	0.08 0.98
Buse-----	30	Fair Organic matter content low Carbonate content Water erosion	0.12 0.46 0.99	Fair Low strength Shrink-swell	0.22 0.87	Fair Carbonate content	0.76
PoA: Peever-----	60	Fair Organic matter content low Too clayey Sodium content Water erosion	0.12 0.12 0.97 0.99	Poor Low strength Shrink-swell	0.00 0.12	Fair Too clayey Sodium content	0.08 0.98

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
PoA: (cont.) Cavour-----	30	Fair Organic matter content low Too clayey Salinity Sodium content Carbonate content Water erosion	0.12 0.12 0.50 0.90 0.99 0.99	Poor Low strength Shrink-swell	0.00 0.31	Poor Sodium content Salinity Too clayey	0.00 0.00 0.08
Pp: Pits, gravel and sand-----	90	Poor Too sandy Organic matter content low Droughty	0.00 0.12 0.84	Poor Slope	0.00	Poor Too sandy Rock fragments Slope Hard to reclaim (rock fragments)	0.00 0.00 0.00 0.18
Pr: Playmoor-----	85	Fair Organic matter content low Salinity Sodium content	0.12 0.88 0.97	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.87	Poor Wetness depth Salinity	0.00 0.00
Py: Playmoor, channeled--	50	Fair Organic matter content low Salinity Sodium content	0.12 0.88 0.97	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.87	Poor Wetness depth Salinity	0.00 0.00
Lamoure, channeled--	40	Fair Water erosion	0.90	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.91	Poor Wetness depth	0.00
Ra: Ranslo-----	85	Poor Too clayey Organic matter content low Carbonate content Water erosion	0.00 0.12 0.46 0.99	Poor Low strength Shrink-swell Wetness depth	0.00 0.12 0.53	Poor Too clayey Wetness depth	0.00 0.53
Re: Ranslo-----	50	Poor Too clayey Organic matter content low Carbonate content Water erosion	0.00 0.12 0.46 0.99	Poor Low strength Shrink-swell Wetness depth	0.00 0.12 0.53	Poor Too clayey Wetness depth	0.00 0.53

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Re: (cont.) Harriet-----	40	Poor Sodium content Organic matter content low Carbonate content Salinity Water erosion	 0.00 0.12 0.46 0.88 0.99	Poor Wetness depth Low strength Shrink-swell	 0.00 0.00 0.79	Poor Wetness depth Sodium content Salinity	 0.00 0.00 0.00
RfA: Renshaw-----	55	Fair Too sandy Organic matter content low Droughty	 0.01 0.12 0.99	Good		Poor Rock fragments Too sandy Hard to reclaim (rock fragments)	 0.00 0.01 0.08
Fordville-----	35	Fair Organic matter content low	 0.12	Good		Fair Hard to reclaim (rock fragments)	 0.18
RfB: Renshaw-----	60	Fair Too sandy Organic matter content low Droughty	 0.01 0.12 0.99	Good		Poor Rock fragments Too sandy Hard to reclaim (rock fragments)	 0.00 0.01 0.08
Fordville-----	30	Fair Organic matter content low	 0.12	Good		Fair Hard to reclaim (rock fragments)	 0.18
So: Southam-----	90	Poor Too clayey Carbonate content Water erosion	 0.00 0.92 0.99	Poor Wetness depth Low strength Shrink-swell	 0.00 0.00 0.12	Poor Wetness depth Too clayey Salinity	 0.00 0.00 0.88
St: Stickney-----	60	Fair Sodium content Organic matter content low Salinity Water erosion	 0.22 0.50 0.88 0.99	Poor Low strength Shrink-swell	 0.00 0.72	Poor Salinity Sodium content	 0.00 0.22
Dudley-----	30	Poor Sodium content Organic matter content low Too clayey Salinity Water erosion	 0.00 0.12 0.12 0.50 0.99	Poor Low strength Shrink-swell	 0.00 0.41	Poor Salinity Too clayey Sodium content	 0.00 0.10 0.78
Su: Stickney-----	40	Fair Sodium content Organic matter content low Salinity Water erosion	 0.22 0.50 0.88 0.99	Poor Low strength Shrink-swell	 0.00 0.72	Poor Salinity Sodium content	 0.00 0.22

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Su: (cont.) Dudley-----	30	Poor Sodium content Organic matter content low Too clayey Salinity Water erosion	0.00 0.12 0.12 0.50 0.99	Poor Low strength Shrink-swell	0.00 0.41	Poor Salinity Too clayey Sodium content	0.00 0.10 0.78
Hoven-----	20	Poor Sodium content Too clayey Organic matter content low Salinity Water erosion	0.00 0.02 0.50 0.88 0.99	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.12	Poor Wetness depth Sodium content Salinity Too clayey	0.00 0.00 0.00 0.01
Sw: Straw, channeled----	85	Fair Organic matter content low	0.88	Fair Shrink-swell	0.98	Good	
Sx: Straw-----	90	Fair Organic matter content low	0.88	Fair Shrink-swell	0.98	Good	
TbE: Talmo, stony-----	45	Fair Organic matter content low Too sandy Droughty	0.12 0.30 0.81	Poor Slope	0.00	Poor Rock fragments Hard to reclaim (rock fragments) Slope Too sandy	0.00 0.00 0.00 0.30
Ethan, stony-----	35	Fair Organic matter content low Carbonate content Water erosion	0.12 0.68 0.99	Poor Slope Low strength Shrink-swell	0.00 0.00 0.87	Poor Slope Carbonate content	0.00 0.96
Te: Tetonka-----	90	Poor Too clayey Organic matter content low Water erosion	0.00 0.50 0.99	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.16	Poor Wetness depth Too clayey	0.00 0.00
Tk: Toko-----	90	Fair Organic matter content low	0.12	Poor Wetness depth	0.00	Poor Wetness depth	0.00
Tm: Toko, wet-----	90	Fair Organic matter content low	0.12	Poor Wetness depth	0.00	Poor Wetness depth	0.00

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Tn: Tonka-----	90	Poor Too clayey Organic matter content low Water erosion	 0.00 0.50 0.90	Poor Wetness depth Low strength Shrink-swell	 0.00 0.00 0.61	Poor Wetness depth Too clayey	 0.00 0.00
To: Tonka-----	60	Poor Too clayey Organic matter content low Water erosion	 0.00 0.50 0.90	Poor Wetness depth Low strength Shrink-swell	 0.00 0.00 0.61	Poor Wetness depth Too clayey	 0.00 0.00
Rimlap-----	30	Poor Too clayey Organic matter content low Water erosion	 0.00 0.88 0.99	Poor Low strength Wetness depth Shrink-swell	 0.00 0.12 0.31	Poor Too clayey Wetness depth	 0.00 0.12
Us: Udorthents, silty---	90	Fair Organic matter content low Water erosion	 0.12 0.99	Fair Low strength Shrink-swell	 0.78 0.87	Good	
Va: Vallars-----	60	Fair Organic matter content low Carbonate content Water erosion	 0.12 0.46 0.99	Poor Wetness depth Low strength	 0.00 0.22	Poor Wetness depth Carbonate content	 0.00 0.71
Hamerly-----	30	Fair Organic matter content low Carbonate content Water erosion	 0.12 0.68 0.99	Fair Low strength Shrink-swell Wetness depth	 0.22 0.87 0.91	Fair Wetness depth	 0.91
VgA: Vang-----	85	Fair Organic matter content low	 0.50	Good		Fair Hard to reclaim (rock fragments) Rock fragments	 0.02 0.12
W: Water-----	100	Not rated		Not rated		Not rated	
WaA: Williams-----	50	Fair Organic matter content low Water erosion	 0.50 0.99	Poor Low strength Shrink-swell	 0.00 0.87	Good	
Bowbells-----	40	Fair Water erosion	 0.99	Poor Low strength Shrink-swell	 0.00 0.87	Good	

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WaB: Williams-----	60	Fair Organic matter content low Water erosion	0.50 0.99	Poor Low strength Shrink-swell	0.00 0.87	Good	
Bowbells-----	30	Fair Water erosion	0.99	Poor Low strength Shrink-swell	0.00 0.87	Good	
WbA: Williams-----	45	Fair Organic matter content low Water erosion	0.50 0.99	Poor Low strength Shrink-swell	0.00 0.87	Good	
Bowbells-----	25	Fair Water erosion	0.99	Poor Low strength Shrink-swell	0.00 0.87	Good	
Tonka-----	20	Poor Too clayey Organic matter content low Water erosion	0.00 0.50 0.90	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.61	Poor Wetness depth Too clayey	0.00 0.00
WbB: Williams-----	50	Fair Organic matter content low Water erosion	0.50 0.99	Poor Low strength Shrink-swell	0.00 0.87	Good	
Bowbells-----	25	Fair Water erosion	0.99	Poor Low strength Shrink-swell	0.00 0.87	Good	
Tonka-----	20	Poor Too clayey Organic matter content low Water erosion	0.00 0.50 0.90	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.61	Poor Wetness depth Too clayey	0.00 0.00
WcA: Williams-----	55	Fair Organic matter content low Water erosion	0.50 0.99	Poor Low strength Shrink-swell	0.00 0.87	Good	
Niobell-----	30	Fair Sodium content Too clayey Organic matter content low Water erosion	0.22 0.32 0.50 0.99	Fair Shrink-swell	0.69	Fair Sodium content Too clayey	0.22 0.30
WcB: Williams-----	60	Fair Organic matter content low Water erosion	0.50 0.99	Poor Low strength Shrink-swell	0.00 0.87	Good	

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WcB: (cont.) Niobell-----	30	Fair Sodium content Too clayey Organic matter content low Water erosion	0.22 0.32 0.50 0.99	Fair Shrink-swell	0.69	Fair Sodium content Too clayey	0.22 0.30
WdA: Williams-----	45	Fair Organic matter content low Water erosion	0.50 0.99	Poor Low strength Shrink-swell	0.00 0.87	Good	
Niobell-----	25	Fair Sodium content Too clayey Organic matter content low Water erosion	0.22 0.32 0.50 0.99	Fair Shrink-swell	0.69	Fair Sodium content Too clayey	0.22 0.30
Tonka-----	20	Poor Too clayey Organic matter content low Water erosion	0.00 0.50 0.90	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.61	Poor Wetness depth Too clayey	0.00 0.00
WhD: Williams-----	50	Fair Organic matter content low Water erosion	0.50 0.99	Poor Low strength Shrink-swell	0.00 0.87	Good	
Vida-----	40	Fair Organic matter content low Water erosion	0.12 0.99	Fair Low strength Shrink-swell	0.78 0.87	Fair Slope	0.37
WmB: Williams-----	50	Fair Organic matter content low Water erosion	0.50 0.99	Poor Low strength Shrink-swell	0.00 0.87	Good	
Zahl-----	25	Fair Organic matter content low Carbonate content Water erosion	0.12 0.92 0.99	Poor Low strength Shrink-swell	0.00 0.87	Good	
Bowbells-----	20	Fair Water erosion	0.99	Poor Low strength Shrink-swell	0.00 0.87	Good	
WmC: Williams-----	45	Fair Organic matter content low Water erosion	0.50 0.99	Poor Low strength Shrink-swell	0.00 0.87	Good	

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WmC: (cont.) Zahl-----	30	Fair Organic matter content low Carbonate content Water erosion	0.12 0.92 0.99	Poor Low strength Shrink-swell	0.00 0.87	Good	
Bowbells-----	20	Fair Water erosion	0.99	Poor Low strength Shrink-swell	0.00 0.87	Good	
Wn: Winship-----	60	Fair Water erosion	0.99	Poor Low strength Wetness depth Shrink-swell	0.00 0.91 0.98	Fair Wetness depth	0.91
Tonka-----	30	Poor Too clayey Organic matter content low Water erosion	0.00 0.50 0.90	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.61	Poor Wetness depth Too clayey	0.00 0.00
Wo: Winship-----	60	Fair Water erosion	0.99	Poor Low strength Wetness depth Shrink-swell	0.00 0.91 0.94	Fair Wetness depth	0.91
Tonka-----	30	Poor Too clayey Organic matter content low Water erosion	0.00 0.50 0.90	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.61	Poor Wetness depth Too clayey	0.00 0.00
Ws: Woonsocket-----	50	Fair Organic matter content low Sodium content	0.12 0.22	Good		Fair Sodium content	0.22
Whitelake-----	35	Fair Organic matter content low Sodium content Salinity	0.12 0.22 0.88	Good		Fair Sodium content Salinity	0.22 0.88
Wt: Worthing-----	90	Poor Too clayey Water erosion	0.00 0.99	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.12	Poor Too clayey Wetness depth	0.00 0.00
Ww: Worthing, ponded----	90	Poor Too clayey Water erosion	0.00 0.99	Poor Wetness depth Low strength Shrink-swell	0.00 0.00 0.12	Poor Too clayey Wetness depth	0.00 0.00

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ZaE: Zahill-----	85	Fair Organic matter content low Carbonate content Water erosion	0.12 0.99 0.99	Poor Slope Low strength Shrink-swell	0.00 0.22 0.87	Poor Slope	0.00
ZbC: Zahl-----	50	Fair Organic matter content low Carbonate content Water erosion	0.12 0.92 0.99	Poor Low strength Shrink-swell	0.00 0.87	Good	
Max-----	40	Fair Organic matter content low Carbonate content Water erosion	0.50 0.92 0.99	Fair Low strength Shrink-swell	0.22 0.91	Good	
ZbD: Zahl-----	55	Fair Organic matter content low Carbonate content Water erosion	0.12 0.92 0.99	Poor Low strength Slope Shrink-swell	0.00 0.82 0.87	Poor Slope	0.00
Max-----	35	Fair Organic matter content low Carbonate content Water erosion	0.50 0.92 0.99	Fair Low strength Shrink-swell	0.22 0.91	Fair Slope	0.37
ZgD: Zell-----	55	Fair Organic matter content low Carbonate content Water erosion	0.12 0.80 0.90	Fair Slope	0.92	Poor Slope	0.00
Great Bend-----	35	Fair Organic matter content low Water erosion Carbonate content	0.12 0.90 0.97	Poor Low strength	0.00	Good	

Ponds and Embankments

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Aa: Aastad-----	85	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.07	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave	0.95 0.81 0.10
Ab: Aastad-----	50	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.07	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave	0.95 0.81 0.10
Hamerly-----	35	Somewhat limited Seepage	0.70	Somewhat limited Depth to saturated zone Piping	0.84 0.56	Somewhat limited Slow refill Cutbanks cave Depth to saturated zone	0.95 0.10 0.07
Ad: Aastad-----	60	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.07	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave	0.95 0.81 0.10
Tonka-----	30	Somewhat limited Seepage	0.57	Very limited Ponding Depth to saturated zone	1.00 1.00	Somewhat limited Slow refill Cutbanks cave	0.30 0.10
Ae: Aberdeen-----	55	Somewhat limited Seepage	0.43	Somewhat limited Piping	0.78	Very limited Cutbanks cave Slow refill Depth to saturated zone Salinity and saturated zone	1.00 0.95 0.90 0.01
Nahon-----	35	Somewhat limited Seepage	0.05	Very limited Piping Salinity	1.00 0.12	Very limited Cutbanks cave Slow refill Depth to saturated zone Salinity and saturated zone	1.00 0.95 0.90 0.50

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ah: Aberdeen-----	55	Somewhat limited Seepage	0.43	Somewhat limited Piping	0.78	Very limited Cutbanks cave Depth to saturated zone Slow refill Salinity and saturated zone	1.00 0.90 0.57 0.01
Nahon-----	35	Somewhat limited Seepage	0.05	Very limited Piping Salinity	1.00 0.12	Very limited Cutbanks cave Slow refill Depth to saturated zone Salinity and saturated zone	1.00 0.95 0.90 0.50
An: Aberdeen-----	45	Somewhat limited Seepage	0.43	Somewhat limited Piping	0.78	Very limited Cutbanks cave Depth to saturated zone Slow refill Salinity and saturated zone	1.00 0.90 0.57 0.01
Nahon-----	25	Somewhat limited Seepage	0.05	Very limited Piping Salinity	1.00 0.12	Very limited Cutbanks cave Slow refill Depth to saturated zone Salinity and saturated zone	1.00 0.95 0.90 0.50
Heil-----	20	Not limited		Very limited Depth to saturated zone Hard to pack Ponding Salinity	1.00 1.00 1.00 0.12	Very limited Slow refill Salinity and saturated zone Cutbanks cave	1.00 0.50 0.10
Ao: Aberdeen-----	45	Somewhat limited Seepage	0.43	Somewhat limited Piping	0.78	Very limited Cutbanks cave Slow refill Depth to saturated zone Salinity and saturated zone	1.00 0.95 0.90 0.01
Nahon-----	25	Somewhat limited Seepage	0.05	Very limited Piping Salinity	1.00 0.12	Very limited Cutbanks cave Slow refill Depth to saturated zone Salinity and saturated zone	1.00 0.95 0.90 0.50

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ao: (cont.) Heil-----	20	Not limited		Very limited Depth to saturated zone Hard to pack Ponding Salinity	1.00 1.00 1.00 0.12	Very limited Slow refill Salinity and saturated zone Cutbanks cave	1.00 0.50 0.10
At: Aguents, loamy-----	90	Somewhat limited Seepage	0.43	Very limited Ponding Depth to saturated zone Piping	1.00 1.00 0.62	Very limited Cutbanks cave Slow refill	1.00 0.57
BaC: Beadle-----	80	Very limited Slope Seepage	1.00 0.05	Not limited		Very limited Depth to water	1.00
BdA: Beadle-----	50	Somewhat limited Seepage	0.05	Not limited		Very limited Depth to water Slow refill	1.00 0.95
Dudley-----	35	Somewhat limited Seepage	0.01	Very limited Piping Salinity	1.00 0.50	Somewhat limited Slow refill Depth to saturated zone Salinity and saturated zone Cutbanks cave	0.99 0.90 0.78 0.10
BeA: Beadle-----	60	Somewhat limited Seepage	0.05	Not limited		Very limited Depth to water Slow refill	1.00 0.95
Stickney-----	30	Somewhat limited Seepage	0.01	Somewhat limited Piping Salinity	0.78 0.12	Somewhat limited Slow refill Depth to saturated zone Salinity and saturated zone Cutbanks cave	0.99 0.90 0.50 0.10
BeB: Beadle-----	60	Somewhat limited Slope Seepage	0.08 0.05	Not limited		Very limited Depth to water Slow refill	1.00 0.95
Stickney-----	30	Somewhat limited Seepage	0.01	Somewhat limited Piping Salinity	0.78 0.12	Somewhat limited Slow refill Depth to saturated zone Salinity and saturated zone Cutbanks cave	0.99 0.90 0.50 0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BfA:							
Beadle, stony-----	60	Somewhat limited Seepage	0.05	Not limited		Very limited Depth to water Slow refill	1.00 0.95
Stickney, stony-----	30	Somewhat limited Seepage	0.01	Somewhat limited Piping Salinity	0.78 0.12	Somewhat limited Slow refill Depth to saturated zone Salinity and saturated zone Cutbanks cave	0.99 0.90 0.50 0.10
BfB:							
Beadle, stony-----	60	Somewhat limited Slope Seepage	0.08 0.05	Not limited		Very limited Depth to water Slow refill	1.00 0.95
Stickney, stony-----	30	Somewhat limited Seepage	0.01	Somewhat limited Piping Salinity	0.78 0.12	Somewhat limited Slow refill Depth to saturated zone Salinity and saturated zone Cutbanks cave	0.99 0.90 0.50 0.10
Bg:							
Bearden-----	85	Somewhat limited Seepage	0.57	Somewhat limited Depth to saturated zone Piping	0.84 0.02	Somewhat limited Slow refill Cutbanks cave Depth to saturated zone	0.43 0.10 0.07
Bk:							
Bearden-----	60	Somewhat limited Seepage	0.57	Somewhat limited Depth to saturated zone Piping	0.84 0.02	Somewhat limited Slow refill Cutbanks cave Depth to saturated zone	0.43 0.10 0.07
Tonka-----	30	Somewhat limited Seepage	0.57	Very limited Ponding Depth to saturated zone	1.00 1.00	Somewhat limited Slow refill Cutbanks cave	0.30 0.10
Bo:							
Beotia-----	90	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.84	Very limited Depth to water Slow refill	1.00 0.57
Br:							
Beotia-----	50	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.84	Very limited Depth to water Slow refill	1.00 0.57

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Br: (cont.) Rondell-----	35	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.54	Very limited Cutbanks cave Depth to saturated zone Slow refill Salinity and saturated zone	1.00 0.90 0.57 0.01
Bs: Beotia-----	60	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.84	Very limited Cutbanks cave Depth to saturated zone Slow refill	1.00 0.90 0.57
Winship-----	30	Somewhat limited Seepage	0.70	Somewhat limited Depth to saturated zone Piping	0.84 0.15	Somewhat limited Slow refill Cutbanks cave Depth to saturated zone	0.95 0.10 0.07
Bt: Beotia-----	60	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.39	Very limited Cutbanks cave Depth to saturated zone Slow refill	1.00 0.90 0.57
Winship-----	30	Somewhat limited Seepage	0.05	Somewhat limited Depth to saturated zone Piping	0.84 0.08	Somewhat limited Slow refill Cutbanks cave Depth to saturated zone	0.95 0.10 0.07
Bu: Bon-----	90	Very limited Seepage	1.00	Very limited Piping	0.99	Very limited Cutbanks cave Depth to saturated zone	1.00 0.81
Bw: Bon, channeled-----	85	Very limited Seepage	1.00	Very limited Piping	0.99	Very limited Cutbanks cave Depth to saturated zone	1.00 0.81
BxD: Buse-----	55	Very limited Slope Seepage	1.00 0.05	Somewhat limited Piping	0.90	Very limited Depth to water	1.00
Barnes-----	35	Very limited Slope Seepage	1.00 0.57	Somewhat limited Piping	0.15	Very limited Depth to water	1.00
ByE: Buse, stony-----	50	Very limited Slope Seepage	1.00 0.05	Somewhat limited Piping	0.96	Very limited Depth to water	1.00

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ByE: (cont.) Barnes, stony-----	35	Very limited Slope Seepage	1.00 0.05	Somewhat limited Piping	0.85	Very limited Depth to water	1.00
BzE: Buse-----	50	Very limited Slope Seepage	1.00 0.05	Somewhat limited Piping	0.90	Very limited Depth to water	1.00
Langhei-----	40	Very limited Slope Seepage	1.00 0.05	Somewhat limited Piping	0.50	Very limited Depth to water	1.00
Ca: Camtown-----	55	Somewhat limited Seepage	0.43	Very limited Piping	1.00	Somewhat limited Depth to saturated zone Slow refill Cutbanks cave Salinity and saturated zone	0.90 0.57 0.10 0.06
Turton-----	30	Somewhat limited Seepage	0.43	Very limited Piping Salinity	1.00 0.12	Somewhat limited Depth to saturated zone Slow refill Salinity and saturated zone Cutbanks cave	0.90 0.57 0.50 0.10
Cf: Cavour-----	55	Somewhat limited Seepage	0.01	Very limited Piping Salinity	1.00 0.50	Somewhat limited Slow refill Depth to saturated zone Salinity and saturated zone Cutbanks cave	0.99 0.90 0.78 0.10
Ferney-----	35	Not limited		Very limited Hard to pack Salinity	1.00 0.12	Very limited Slow refill Depth to saturated zone Salinity and saturated zone Cutbanks cave	1.00 0.90 0.50 0.10
Co: Colvin, saline-----	85	Somewhat limited Seepage	0.43	Very limited Ponding Depth to saturated zone Salinity Piping	1.00 1.00 0.12 0.02	Somewhat limited Slow refill Salinity and saturated zone Cutbanks cave	0.57 0.50 0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Cr: Cresbard-----	60	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.80	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave Salinity and saturated zone	0.95 0.90 0.10 0.01
Cavour-----	30	Somewhat limited Seepage	0.01	Very limited Piping Salinity	1.00 0.50	Somewhat limited Slow refill Depth to saturated zone Salinity and saturated zone Cutbanks cave	0.99 0.90 0.78 0.10
Cs: Cresbard-----	40	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.80	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave Salinity and saturated zone	0.95 0.90 0.10 0.01
Cavour-----	30	Somewhat limited Seepage	0.01	Very limited Piping Salinity	1.00 0.50	Somewhat limited Slow refill Depth to saturated zone Salinity and saturated zone Cutbanks cave	0.99 0.90 0.78 0.10
Heil-----	20	Not limited		Very limited Depth to saturated zone Hard to pack Ponding Salinity	1.00 1.00 1.00 0.12	Very limited Slow refill Salinity and saturated zone Cutbanks cave	1.00 0.50 0.10
Ct: Crossplain-----	60	Somewhat limited Seepage	0.01	Very limited Depth to saturated zone Piping	1.00 0.08	Somewhat limited Slow refill Cutbanks cave Salinity and saturated zone	0.30 0.10 0.01
Tetonka-----	30	Somewhat limited Seepage	0.01	Very limited Depth to saturated zone Ponding	1.00 1.00	Somewhat limited Slow refill Cutbanks cave Salinity and saturated zone	0.30 0.10 0.01
Da: Davis-----	55	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.88	Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	0.81 0.30 0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Da: (cont.) Northville-----	35	Somewhat limited Seepage	0.43	Somewhat limited Piping Salinity	0.78 0.12	Somewhat limited Depth to saturated zone Slow refill Salinity and saturated zone Cutbanks cave	0.81 0.57 0.50 0.10
Db: Davison-----	85	Somewhat limited Seepage	0.70	Somewhat limited Piping Depth to saturated zone	0.93 0.68	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave Salinity and saturated zone	0.30 0.14 0.10 0.01
Dd: Davison-----	50	Somewhat limited Seepage	0.70	Somewhat limited Piping Depth to saturated zone	0.93 0.68	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave Salinity and saturated zone	0.30 0.14 0.10 0.01
Tetonka-----	40	Somewhat limited Seepage	0.01	Very limited Depth to saturated zone Ponding	1.00 1.00	Somewhat limited Slow refill Cutbanks cave Salinity and saturated zone	0.30 0.10 0.01
DeA: Delmont-----	55	Very limited Seepage	1.00	Somewhat limited Seepage	0.08	Very limited Depth to water	1.00
Enet-----	35	Very limited Seepage	1.00	Somewhat limited Seepage	0.08	Very limited Depth to water	1.00
Dk: Dimo-----	85	Very limited Seepage	1.00	Somewhat limited Seepage	0.10	Very limited Cutbanks cave Depth to saturated zone	1.00 0.81
Dm: Dimo-----	55	Very limited Seepage	1.00	Somewhat limited Depth to saturated zone Seepage	0.95 0.10	Very limited Cutbanks cave Depth to saturated zone	1.00 0.02
Grat-----	30	Very limited Seepage	1.00	Very limited Depth to saturated zone Ponding Piping Seepage	1.00 1.00 0.76 0.08	Very limited Cutbanks cave	1.00

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
DoA: Doland-----	50	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.73	Very limited Depth to water Slow refill	1.00 0.95
Embden-----	30	Very limited Seepage	1.00	Somewhat limited Seepage	0.12	Very limited Cutbanks cave Depth to saturated zone	1.00 0.81
Dq: Dovecreek-----	90	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.22	Very limited Depth to water Slow refill	1.00 0.30
Dr: Dovray-----	90	Somewhat limited Seepage	0.01	Very limited Ponding Depth to saturated zone Hard to pack	1.00 1.00 0.99	Somewhat limited Slow refill Cutbanks cave	0.99 0.10
Du: Dudley-----	55	Somewhat limited Seepage	0.01	Very limited Piping Salinity	1.00 0.50	Somewhat limited Slow refill Depth to saturated zone Salinity and saturated zone Cutbanks cave	0.99 0.90 0.78 0.10
Jerauld-----	35	Not limited		Very limited Hard to pack Salinity	1.00 0.12	Very limited Slow refill Depth to saturated zone Salinity and saturated zone Cutbanks cave	1.00 0.90 0.50 0.10
Dx: Durrstein-----	85	Not limited		Very limited Depth to saturated zone Hard to pack Salinity	1.00 1.00 0.12	Very limited Slow refill Salinity and saturated zone Cutbanks cave	1.00 0.50 0.10
Ea: Eckman-----	85	Somewhat limited Seepage	0.70	Very limited Piping	1.00	Very limited Depth to water	1.00
EcA: Eckman-----	50	Somewhat limited Seepage	0.70	Very limited Piping	1.00	Very limited Depth to water	1.00
Gardena-----	40	Very limited Seepage	1.00	Very limited Piping	1.00	Somewhat limited Depth to saturated zone Cutbanks cave	0.81 0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
EcB: Eckman-----	60	Somewhat limited Seepage Slope	0.70 0.08	Very limited Piping	1.00	Very limited Depth to water	1.00
Gardena-----	30	Very limited Seepage	1.00	Very limited Piping	1.00	Somewhat limited Depth to saturated zone Cutbanks cave	0.81 0.10
EdB: Eckman-----	60	Somewhat limited Seepage Slope	0.70 0.08	Very limited Piping	1.00	Very limited Depth to water	1.00
Zell-----	30	Somewhat limited Seepage Slope	0.70 0.08	Very limited Piping	1.00	Very limited Depth to water	1.00
EeB: Edgeley-----	85	Somewhat limited Seepage Depth to bedrock Slope	0.70 0.11 0.08	Somewhat limited Thin layer Piping	0.85 0.07	Very limited Depth to water	1.00
EeC: Edgeley-----	85	Very limited Slope Seepage Depth to bedrock	1.00 0.70 0.11	Somewhat limited Thin layer Piping	0.85 0.07	Very limited Depth to water	1.00
EeD: Edgeley-----	85	Very limited Slope Seepage Depth to bedrock	1.00 0.70 0.11	Somewhat limited Thin layer Piping	0.85 0.07	Very limited Depth to water	1.00
EgA: Egeland-----	50	Very limited Seepage	1.00	Somewhat limited Seepage	0.11	Very limited Depth to water	1.00
Embden-----	40	Very limited Seepage	1.00	Somewhat limited Seepage	0.12	Very limited Cutbanks cave Depth to saturated zone	1.00 0.81
EgB: Egeland-----	50	Very limited Seepage Slope	1.00 0.08	Somewhat limited Seepage	0.11	Very limited Depth to water	1.00
Embden-----	35	Very limited Seepage Slope	1.00 0.08	Somewhat limited Seepage	0.12	Very limited Cutbanks cave Depth to saturated zone	1.00 0.81

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ek: Elsmere-----	85	Very limited Seepage	1.00	Somewhat limited Depth to saturated zone Seepage	0.95 0.08	Very limited Cutbanks cave Depth to saturated zone	1.00 0.02
EmE: Ethan-----	50	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.59	Very limited Depth to water	1.00
Betts-----	40	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.14	Very limited Depth to water	1.00
EnD: Ethan-----	55	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.59	Very limited Depth to water	1.00
Hand-----	35	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.98	Very limited Depth to water	1.00
Er: Exline-----	50	Not limited		Very limited Hard to pack Depth to saturated zone Salinity	1.00 0.84 0.12	Very limited Cutbanks cave Slow refill Salinity and saturated zone Depth to saturated zone	1.00 1.00 0.50 0.07
Aberdeen-----	25	Somewhat limited Seepage	0.43	Somewhat limited Piping	0.78	Very limited Cutbanks cave Depth to saturated zone Slow refill Salinity and saturated zone	1.00 0.90 0.57 0.01
Nahon-----	20	Somewhat limited Seepage	0.05	Very limited Piping Salinity	1.00 0.12	Very limited Cutbanks cave Slow refill Depth to saturated zone Salinity and saturated zone	1.00 0.95 0.90 0.50
Et: Exline-----	50	Somewhat limited Seepage	0.05	Very limited Hard to pack Depth to saturated zone Salinity	1.00 0.84 0.12	Very limited Cutbanks cave Slow refill Salinity and saturated zone Depth to saturated zone	1.00 0.95 0.50 0.07

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Et: (cont.) Aberdeen-----	25	Somewhat limited Seepage	0.43	Somewhat limited Piping	0.78	Very limited Cutbanks cave Slow refill Depth to saturated zone Salinity and saturated zone	1.00 0.95 0.90 0.01
Nahon-----	20	Somewhat limited Seepage	0.05	Very limited Piping Salinity	1.00 0.12	Very limited Cutbanks cave Slow refill Depth to saturated zone Salinity and saturated zone	1.00 0.95 0.90 0.50
Ew: Exline-----	50	Not limited		Very limited Hard to pack Depth to saturated zone Salinity	1.00 0.84 0.12	Very limited Cutbanks cave Slow refill Salinity and saturated zone Depth to saturated zone	1.00 1.00 0.50 0.07
Heil-----	40	Not limited		Very limited Depth to saturated zone Hard to pack Ponding Salinity	1.00 1.00 1.00 0.12	Very limited Slow refill Salinity and saturated zone Cutbanks cave	1.00 0.50 0.10
Ex: Exline-----	50	Somewhat limited Seepage	0.05	Very limited Hard to pack Depth to saturated zone Salinity	1.00 0.84 0.12	Very limited Cutbanks cave Slow refill Salinity and saturated zone Depth to saturated zone	1.00 0.95 0.50 0.07
Heil-----	40	Not limited		Very limited Depth to saturated zone Hard to pack Ponding Salinity	1.00 1.00 1.00 0.12	Very limited Slow refill Salinity and saturated zone Cutbanks cave	1.00 0.50 0.10
EyA: Exline-----	45	Not limited		Very limited Hard to pack Salinity	1.00 0.12	Very limited Cutbanks cave Slow refill Depth to saturated zone Salinity and saturated zone	1.00 1.00 0.90 0.50

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
EyA: (cont.) Putney-----	40	Somewhat limited Seepage	0.70	Somewhat limited Piping Salinity	0.77 0.50	Very limited Depth to water Slow refill	1.00 0.57
Fa: Farmsworth-----	50	Somewhat limited Seepage	0.01	Very limited Piping Depth to saturated zone Salinity	1.00 0.95 0.12	Somewhat limited Slow refill Salinity and saturated zone Cutbanks cave Depth to saturated zone	0.99 0.50 0.10 0.02
Durrstein-----	35	Not limited		Very limited Depth to saturated zone Hard to pack Salinity	1.00 1.00 0.12	Very limited Slow refill Salinity and saturated zone Cutbanks cave	1.00 0.50 0.10
Fe: Ferney-----	50	Not limited		Very limited Hard to pack Depth to saturated zone Salinity	1.00 0.84 0.12	Very limited Slow refill Salinity and saturated zone Cutbanks cave Depth to saturated zone	1.00 0.50 0.10 0.07
Heil-----	40	Not limited		Very limited Depth to saturated zone Hard to pack Ponding Salinity	1.00 1.00 1.00 0.12	Very limited Slow refill Salinity and saturated zone Cutbanks cave	1.00 0.50 0.10
Ff: Forestburg-----	60	Very limited Seepage	1.00	Somewhat limited Depth to saturated zone Seepage	0.24 0.10	Very limited Cutbanks cave Slow refill Depth to saturated zone	1.00 0.95 0.38
Elsmere-----	30	Very limited Seepage	1.00	Very limited Depth to saturated zone Seepage	0.99 0.08	Very limited Cutbanks cave Depth to saturated zone	1.00 0.01
Fh: Forestburg-----	45	Very limited Seepage	1.00	Somewhat limited Depth to saturated zone Seepage	0.24 0.10	Very limited Cutbanks cave Slow refill Depth to saturated zone	1.00 0.95 0.38
Elsmere-----	25	Very limited Seepage	1.00	Very limited Depth to saturated zone Seepage	0.99 0.08	Very limited Cutbanks cave Depth to saturated zone	1.00 0.01

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Fh: (cont.) Toko-----	20	Very limited Seepage	1.00	Very limited Depth to saturated zone Piping Ponding Seepage	1.00 1.00 0.04	Somewhat limited Cutbanks cave	0.10
FmA: Forman-----	50	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.90	Very limited Depth to water Slow refill	1.00 0.95
Aastad-----	40	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.07	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave	0.95 0.81 0.10
FmB: Forman-----	60	Somewhat limited Slope Seepage	0.32 0.05	Somewhat limited Piping	0.90	Very limited Depth to water Slow refill	1.00 0.95
Aastad-----	30	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.07	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave	0.95 0.81 0.10
FnC: Forman-----	55	Very limited Slope Seepage	1.00 0.05	Somewhat limited Piping	0.90	Very limited Depth to water	1.00
Buse-----	35	Very limited Slope Seepage	1.00 0.05	Somewhat limited Piping	0.90	Very limited Depth to water	1.00
FrB: Forman-----	50	Somewhat limited Slope Seepage	0.08 0.05	Somewhat limited Piping	0.90	Very limited Depth to water Slow refill	1.00 0.95
Buse-----	25	Somewhat limited Slope Seepage	0.32 0.05	Somewhat limited Piping	0.90	Very limited Depth to water	1.00
Aastad-----	20	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.07	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave	0.95 0.81 0.10
FrC: Forman-----	45	Very limited Slope Seepage	1.00 0.05	Somewhat limited Piping	0.90	Very limited Depth to water	1.00

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FrC: (cont.)							
Buse-----	30	Very limited Slope Seepage	1.00 0.05	Somewhat limited Piping	0.90	Very limited Depth to water	1.00
Aastad-----	20	Somewhat limited Slope Seepage	0.08 0.05	Somewhat limited Piping	0.07	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave	0.95 0.81 0.10
FsA:							
Forman-----	55	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.90	Very limited Depth to water Slow refill	1.00 0.95
Cresbard-----	30	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.80	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave Salinity and saturated zone	0.95 0.90 0.10 0.01
FsB:							
Forman-----	60	Somewhat limited Slope Seepage	0.08 0.05	Somewhat limited Piping	0.90	Very limited Depth to water Slow refill	1.00 0.95
Cresbard-----	30	Somewhat limited Slope Seepage	0.08 0.05	Somewhat limited Piping	0.80	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave Salinity and saturated zone	0.95 0.90 0.10 0.01
FtA:							
Forman-----	45	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.90	Very limited Depth to water Slow refill	1.00 0.95
Cresbard-----	25	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.80	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave Salinity and saturated zone	0.95 0.90 0.10 0.01
Tonka-----	20	Somewhat limited Seepage	0.57	Very limited Ponding Depth to saturated zone	1.00 1.00	Somewhat limited Slow refill Cutbanks cave	0.30 0.10
Ga:							
Gardena-----	90	Very limited Seepage	1.00	Very limited Piping	1.00	Somewhat limited Depth to saturated zone Cutbanks cave	0.81 0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Gd:							
Gardena-----	55	Very limited Seepage	1.00	Very limited Piping	1.00	Somewhat limited Depth to saturated zone Cutbanks cave	0.81 0.10
Glyndon-----	35	Very limited Seepage	1.00	Very limited Piping Depth to saturated zone	1.00 0.24	Somewhat limited Depth to saturated zone Cutbanks cave	0.38 0.10
Ge:							
Gardena-----	50	Very limited Seepage	1.00	Very limited Piping	1.00	Somewhat limited Depth to saturated zone Cutbanks cave	0.81 0.10
Turton-----	35	Somewhat limited Seepage	0.43	Very limited Piping Salinity	1.00 0.12	Somewhat limited Depth to saturated zone Slow refill Salinity and saturated zone Cutbanks cave	0.90 0.57 0.50 0.10
GgA:							
Great Bend-----	90	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.34	Very limited Depth to water Slow refill	1.00 0.57
GnA:							
Great Bend-----	50	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.34	Very limited Depth to water Slow refill	1.00 0.57
Beotia-----	40	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.84	Very limited Depth to water Slow refill	1.00 0.57
GnB:							
Great Bend-----	60	Somewhat limited Seepage Slope	0.70 0.08	Somewhat limited Piping	0.34	Very limited Depth to water Slow refill	1.00 0.57
Beotia-----	30	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.84	Very limited Depth to water Slow refill	1.00 0.57
GoA:							
Great Bend-----	50	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.13	Very limited Depth to water Slow refill	1.00 0.95
Beotia-----	40	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.39	Very limited Depth to water Slow refill	1.00 0.95

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GpA: Great Bend-----	50	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.34	Very limited Depth to water Slow refill	1.00 0.57
Putney-----	35	Somewhat limited Seepage	0.70	Somewhat limited Piping Salinity	0.77 0.50	Very limited Depth to water Slow refill	1.00 0.57
GpB: Great Bend-----	50	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.34	Very limited Depth to water Slow refill	1.00 0.57
Putney-----	35	Somewhat limited Seepage	0.70	Somewhat limited Piping Salinity	0.77 0.50	Very limited Depth to water Slow refill	1.00 0.57
GtB: Great Bend-----	60	Somewhat limited Seepage Slope	0.70 0.08	Somewhat limited Piping	0.34	Very limited Depth to water Slow refill	1.00 0.57
Zell-----	30	Somewhat limited Seepage Slope	0.70 0.08	Very limited Piping	1.00	Very limited Depth to water	1.00
GtC: Great Bend-----	50	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.34	Very limited Depth to water	1.00
Zell-----	40	Very limited Slope Seepage	1.00 0.70	Very limited Piping	1.00	Very limited Depth to water	1.00
GzC: Great Bend-----	45	Somewhat limited Slope Seepage	0.92 0.70	Somewhat limited Piping	0.34	Very limited Depth to water	1.00
Zell-----	25	Very limited Slope Seepage	1.00 0.70	Very limited Piping	1.00	Very limited Depth to water	1.00
Huffton-----	20	Very limited Slope Seepage	1.00 0.70	Very limited Piping Salinity	1.00 0.12	Very limited Depth to water	1.00
HaA: Hamerly-----	85	Somewhat limited Seepage	0.70	Somewhat limited Depth to saturated zone Piping	0.84 0.56	Somewhat limited Slow refill Cutbanks cave Depth to saturated zone	0.95 0.10 0.07

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Hb:							
Hamerly-----	50	Somewhat limited Seepage	0.70	Somewhat limited Depth to saturated zone Piping	0.84 0.56	Somewhat limited Slow refill Cutbanks cave Depth to saturated zone	0.95 0.10 0.07
Tonka-----	40	Somewhat limited Seepage	0.57	Very limited Ponding Depth to saturated zone	1.00 1.00	Somewhat limited Slow refill Cutbanks cave	0.30 0.10
HcA:							
Hand-----	50	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.98	Very limited Depth to water Slow refill	1.00 0.30
Bonilla-----	40	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.32	Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	0.90 0.43 0.10
HcB:							
Hand-----	60	Somewhat limited Seepage Slope	0.70 0.08	Somewhat limited Piping	0.98	Very limited Depth to water Slow refill	1.00 0.30
Bonilla-----	30	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.32	Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	0.90 0.43 0.10
HdA:							
Hand-----	50	Somewhat limited Seepage	0.70	Very limited Piping	0.99	Very limited Depth to water Slow refill	1.00 0.30
Carthage-----	40	Very limited Seepage	1.00	Somewhat limited Piping Depth to saturated zone	0.97 0.09	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave	0.95 0.54 0.10
He:							
Hand-----	45	Somewhat limited Seepage	0.70	Very limited Piping	0.99	Very limited Depth to water Slow refill	1.00 0.30
Carthage-----	25	Very limited Seepage	1.00	Somewhat limited Piping Depth to saturated zone	0.97 0.09	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave	0.95 0.54 0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
He: (cont.) Overshue-----	20	Very limited Seepage	1.00	Very limited Depth to saturated zone Piping Ponding	1.00 1.00 1.00	Somewhat limited Cutbanks cave	0.10
HfC: Hand-----	55	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.98	Very limited Depth to water	1.00
Ethan-----	35	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.59	Very limited Depth to water	1.00
HgB: Hand-----	50	Somewhat limited Seepage Slope	0.70 0.08	Somewhat limited Piping	0.98	Very limited Depth to water Slow refill	1.00 0.30
Ethan-----	25	Somewhat limited Seepage Slope	0.70 0.08	Somewhat limited Piping	0.59	Very limited Depth to water	1.00
Bonilla-----	20	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.32	Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	0.90 0.43 0.10
HgC: Hand-----	45	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.98	Very limited Depth to water	1.00
Ethan-----	30	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.59	Very limited Depth to water	1.00
Bonilla-----	20	Somewhat limited Seepage Slope	0.70 0.08	Somewhat limited Piping	0.32	Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	0.90 0.43 0.10
HhB: Hand-----	50	Somewhat limited Seepage Slope	0.70 0.08	Very limited Piping	0.99	Very limited Depth to water Slow refill	1.00 0.30
Ethan-----	25	Somewhat limited Seepage Slope	0.70 0.08	Somewhat limited Piping	0.59	Very limited Depth to water	1.00
Carthage-----	20	Very limited Seepage	1.00	Somewhat limited Piping Depth to saturated zone	0.97 0.09	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave	0.95 0.54 0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HjB: Hand-----	45	Somewhat limited Seepage Slope	0.70 0.08	Somewhat limited Piping	0.98	Very limited Depth to water Slow refill	1.00 0.30
Talmo-----	35	Very limited Seepage Slope	1.00 0.08	Somewhat limited Seepage	0.08	Very limited Depth to water	1.00
HjC: Hand-----	45	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.98	Very limited Depth to water	1.00
Talmo-----	35	Very limited Seepage Slope	1.00 1.00	Somewhat limited Seepage	0.08	Very limited Depth to water	1.00
Hk: Harmony-----	55	Somewhat limited Seepage	0.43	Somewhat limited Piping	0.02	Very limited Cutbanks cave Slow refill Depth to saturated zone	1.00 0.95 0.90
Aberdeen-----	35	Somewhat limited Seepage	0.43	Somewhat limited Piping	0.78	Very limited Cutbanks cave Slow refill Depth to saturated zone Salinity and saturated zone	1.00 0.95 0.90 0.01
Hm: Harmony-----	55	Somewhat limited Seepage	0.43	Somewhat limited Piping	0.47	Very limited Cutbanks cave Depth to saturated zone Slow refill	1.00 0.90 0.57
Aberdeen-----	35	Somewhat limited Seepage	0.43	Somewhat limited Piping	0.78	Very limited Cutbanks cave Depth to saturated zone Slow refill Salinity and saturated zone	1.00 0.90 0.57 0.01
Hn: Harmony-----	55	Somewhat limited Seepage	0.43	Somewhat limited Piping	0.54	Very limited Cutbanks cave Depth to saturated zone Slow refill	1.00 0.90 0.57
Beotia-----	35	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.84	Very limited Depth to water Slow refill	1.00 0.57

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ho: Harmony-----	55	Somewhat limited Seepage	0.43	Somewhat limited Piping	0.02	Very limited Cutbanks cave Slow refill Depth to saturated zone	1.00 0.95 0.90
Beotia-----	35	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.39	Very limited Depth to water Slow refill	1.00 0.95
Hp: Harriet-----	90	Somewhat limited Seepage	0.70	Very limited Depth to saturated zone Piping Salinity	1.00 1.00 0.12	Somewhat limited Salinity and saturated zone Slow refill Cutbanks cave	0.50 0.30 0.10
Hr: Heil-----	90	Not limited		Very limited Depth to saturated zone Hard to pack Ponding Salinity	1.00 1.00 1.00 0.12	Very limited Slow refill Salinity and saturated zone Cutbanks cave	1.00 0.50 0.10
HsA: Henkin-----	55	Very limited Seepage	1.00	Somewhat limited Seepage	0.03	Very limited Depth to water	1.00
Blendon-----	35	Very limited Seepage	1.00	Somewhat limited Seepage	0.12	Very limited Depth to water	1.00
HsB: Henkin-----	60	Very limited Seepage Slope	1.00 0.08	Somewhat limited Seepage	0.03	Very limited Depth to water	1.00
Blendon-----	30	Very limited Seepage Slope	1.00 0.08	Somewhat limited Seepage	0.12	Very limited Depth to water	1.00
HtB: Houdek-----	50	Somewhat limited Seepage Slope	0.70 0.08	Somewhat limited Piping	0.15	Very limited Depth to water Slow refill	1.00 0.95
Ethan-----	25	Somewhat limited Seepage Slope	0.70 0.08	Somewhat limited Piping	0.59	Very limited Depth to water	1.00
Prosper-----	20	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.19	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave	0.95 0.90 0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HtC:							
Houdek-----	45	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.15	Very limited Depth to water	1.00
Ethan-----	30	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.59	Very limited Depth to water	1.00
Prosper-----	20	Somewhat limited Seepage Slope	0.70 0.08	Somewhat limited Piping	0.19	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave	0.95 0.90 0.10
HuA:							
Houdek-----	50	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.15	Very limited Depth to water Slow refill	1.00 0.95
Prosper-----	40	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.19	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave	0.95 0.90 0.10
HuB:							
Houdek-----	60	Somewhat limited Seepage Slope	0.70 0.08	Somewhat limited Piping	0.15	Very limited Depth to water Slow refill	1.00 0.95
Prosper-----	30	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.19	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave	0.95 0.90 0.10
HwA:							
Houdek-----	55	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.15	Very limited Depth to water Slow refill	1.00 0.95
Stickney-----	35	Somewhat limited Seepage	0.01	Somewhat limited Piping Salinity	0.78 0.12	Somewhat limited Slow refill Depth to saturated zone Salinity and saturated zone Cutbanks cave	0.99 0.90 0.50 0.10
HxA:							
Houdek-----	45	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.15	Very limited Depth to water Slow refill	1.00 0.95

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HxA: (cont.) Stickney-----	25	Somewhat limited Seepage	0.01	Somewhat limited Piping Salinity	0.78 0.12	Somewhat limited Slow refill Depth to saturated zone Salinity and saturated zone Cutbanks cave	0.99 0.90 0.50 0.10
Tetonka-----	20	Somewhat limited Seepage	0.01	Very limited Depth to saturated zone Ponding	1.00 1.00	Somewhat limited Slow refill Cutbanks cave Salinity and saturated zone	0.30 0.10 0.01
Hy: Hoven-----	90	Not limited		Very limited Depth to saturated zone Hard to pack Ponding Salinity	1.00 1.00 1.00 0.12	Very limited Slow refill Salinity and saturated zone Cutbanks cave	1.00 0.50 0.10
Ie: Ipage-----	45	Very limited Seepage Slope	1.00 0.08	Somewhat limited Seepage	0.26	Very limited Cutbanks cave Depth to saturated zone	1.00 0.90
Els-----	25	Very limited Seepage	1.00	Somewhat limited Depth to saturated zone Seepage	0.95 0.28	Very limited Cutbanks cave Depth to saturated zone	1.00 0.02
Shue-----	20	Very limited Seepage	1.00	Very limited Depth to saturated zone Piping Ponding Seepage	1.00 1.00 1.00 0.12	Very limited Cutbanks cave	1.00
Jh: Jerauld-----	50	Not limited		Very limited Hard to pack Depth to saturated zone Salinity	1.00 0.84 0.12	Very limited Slow refill Salinity and saturated zone Cutbanks cave Depth to saturated zone	1.00 0.50 0.10 0.07
Hoven-----	40	Not limited		Very limited Depth to saturated zone Hard to pack Ponding Salinity	1.00 1.00 1.00 0.12	Very limited Slow refill Salinity and saturated zone Cutbanks cave	1.00 0.50 0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KaA:							
Kranzburg-----	50	Somewhat limited Seepage	0.70	Not limited		Very limited Depth to water Slow refill	1.00 0.95
Brookings-----	40	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.06	Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	0.81 0.43 0.10
KbB:							
Kranzburg-----	40	Somewhat limited Seepage Slope	0.70 0.08	Not limited		Very limited Depth to water Slow refill	1.00 0.95
Brookings-----	30	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.06	Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	0.81 0.43 0.10
Buse-----	25	Somewhat limited Slope Seepage	0.32 0.05	Somewhat limited Piping	0.90	Very limited Depth to water	1.00
KcA:							
Kranzburg-----	55	Somewhat limited Seepage	0.70	Not limited		Very limited Depth to water Slow refill	1.00 0.95
Cresbard-----	30	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.80	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave Salinity and saturated zone	0.95 0.90 0.10 0.01
KtA:							
Kranzburg-----	45	Somewhat limited Seepage	0.70	Not limited		Very limited Depth to water Slow refill	1.00 0.95
Cresbard-----	25	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.80	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave Salinity and saturated zone	0.95 0.90 0.10 0.01
Tonka-----	20	Somewhat limited Seepage	0.57	Very limited Ponding Depth to saturated zone	1.00 1.00	Somewhat limited Slow refill Cutbanks cave	0.30 0.10
KzB:							
Kranzburg-----	40	Somewhat limited Seepage Slope	0.70 0.08	Not limited		Very limited Depth to water Slow refill	1.00 0.95

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KzB: (cont.) Zell-----	30	Somewhat limited Seepage Slope	0.70 0.08	Very limited Piping	1.00	Very limited Depth to water	1.00
Aastad-----	20	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.07	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave	0.95 0.81 0.10
La: La Prairie-----	85	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.65	Very limited Cutbanks cave Depth to saturated zone Slow refill	1.00 0.90 0.30
Lc: La Prairie, channeled-----	50	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.65	Very limited Cutbanks cave Depth to saturated zone Slow refill	1.00 0.90 0.30
Holmquist, channeled-----	40	Somewhat limited Seepage	0.70	Very limited Depth to saturated zone Piping Seepage	1.00 1.00 0.03	Very limited Cutbanks cave Slow refill Salinity and saturated zone	1.00 0.30 0.06
Ld: LaDelle-----	90	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.39	Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	0.90 0.30 0.10
Le: LaDelle, channeled--	85	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.39	Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	0.90 0.30 0.10
Lk: Lamo-----	90	Somewhat limited Seepage	0.57	Very limited Depth to saturated zone Piping	0.99 0.12	Somewhat limited Slow refill Cutbanks cave Depth to saturated zone	0.95 0.10 0.01
Lm: Lamoure-----	85	Somewhat limited Seepage	0.57	Very limited Depth to saturated zone	1.00	Somewhat limited Slow refill Cutbanks cave	0.43 0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ln: Lawet-----	85	Very limited Seepage	1.00	Very limited Depth to saturated zone Piping	1.00 1.00	Very limited Cutbanks cave	1.00
Lo: Lawet, wet-----	90	Very limited Seepage	1.00	Very limited Depth to saturated zone Piping Ponding	1.00 1.00 1.00	Very limited Cutbanks cave	1.00
Lp: Lawet-----	60	Very limited Seepage	1.00	Very limited Depth to saturated zone Piping	1.00 1.00	Very limited Cutbanks cave	1.00
Davison-----	30	Somewhat limited Seepage	0.70	Somewhat limited Piping Depth to saturated zone	0.93 0.68	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave Salinity and saturated zone	0.30 0.14 0.10 0.01
LrA: Lehr-----	55	Very limited Seepage	1.00	Somewhat limited Seepage	0.08	Very limited Depth to water	1.00
Bowdle-----	35	Very limited Seepage	1.00	Somewhat limited Seepage	0.08	Very limited Depth to water	1.00
LrB: Lehr-----	60	Very limited Seepage Slope	1.00 0.32	Somewhat limited Seepage	0.08	Very limited Depth to water	1.00
Bowdle-----	30	Very limited Seepage Slope	1.00 0.08	Somewhat limited Seepage	0.08	Very limited Depth to water	1.00
Ls: Lowe-----	85	Somewhat limited Seepage	0.70	Very limited Depth to saturated zone Piping	1.00 0.62	Very limited Cutbanks cave Slow refill	1.00 0.30
Lt: Ludden-----	85	Not limited		Very limited Depth to saturated zone Hard to pack	1.00 0.97	Very limited Slow refill Cutbanks cave	1.00 0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Lu: Ludden, ponded-----	90	Not limited		Very limited Ponding Depth to saturated zone Hard to pack	1.00 1.00 0.97	Very limited Slow refill Cutbanks cave	1.00 0.10
Lw: Ludden, wet-----	85	Not limited		Very limited Ponding Depth to saturated zone Hard to pack	1.00 1.00 0.97	Very limited Slow refill Cutbanks cave	1.00 0.10
M-W: Miscellaneous water-	100	Not rated		Not rated		Not rated	
MaC: Maddock-----	50	Very limited Seepage Slope	1.00 1.00	Somewhat limited Seepage	0.42	Very limited Depth to water	1.00
Egeland-----	35	Very limited Seepage Slope	1.00 1.00	Somewhat limited Seepage	0.11	Very limited Depth to water	1.00
MdA: Max-----	50	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.82	Very limited Depth to water	1.00
Arnegard-----	40	Somewhat limited Seepage	0.70	Very limited Piping	0.99	Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	0.90 0.30 0.10
MdB: Max-----	60	Somewhat limited Slope Seepage	0.32 0.05	Somewhat limited Piping	0.82	Very limited Depth to water	1.00
Arnegard-----	30	Somewhat limited Seepage	0.70	Very limited Piping	0.99	Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	0.90 0.30 0.10
MgB: Max-----	45	Somewhat limited Slope Seepage	0.32 0.05	Somewhat limited Piping	0.82	Very limited Depth to water	1.00
Arnegard-----	30	Somewhat limited Seepage	0.70	Very limited Piping	0.99	Somewhat limited Depth to saturated zone Slow refill Cutbanks cave	0.90 0.30 0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MgB: (cont.) Zahl-----	20	Somewhat limited Seepage Slope	0.70 0.32	Somewhat limited Piping	0.15	Very limited Depth to water	1.00
MnB: Max-----	40	Somewhat limited Slope Seepage	0.32 0.05	Somewhat limited Piping	0.82	Very limited Depth to water	1.00
Niobell-----	30	Somewhat limited Slope Seepage	0.08 0.05	Very limited Piping	1.00	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave Salinity and saturated zone	0.95 0.90 0.10 0.01
Noonan-----	20	Somewhat limited Slope	0.08	Somewhat limited Piping	0.89	Very limited Slow refill Depth to saturated zone Cutbanks cave Salinity and saturated zone	1.00 0.90 0.10 0.01
MxC: Max-----	45	Very limited Slope Seepage	1.00 0.05	Somewhat limited Piping	0.82	Very limited Depth to water	1.00
Zahl-----	30	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.15	Very limited Depth to water	1.00
Arnegard-----	20	Somewhat limited Seepage Slope	0.70 0.08	Very limited Piping	0.99	Very limited Depth to water Slow refill	1.00 0.30
My: Miranda-----	50	Not limited		Very limited Piping Depth to saturated zone Salinity	1.00 0.84 0.12	Very limited Slow refill Salinity and saturated zone Cutbanks cave Depth to saturated zone	1.00 0.50 0.10 0.07
Heil-----	40	Not limited		Very limited Depth to saturated zone Hard to pack Ponding Salinity	1.00 1.00 1.00 0.12	Very limited Slow refill Salinity and saturated zone Cutbanks cave	1.00 0.50 0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Mz:							
Moritz-----	55	Somewhat limited Seepage	0.70	Somewhat limited Depth to saturated zone Piping	0.95 0.57	Very limited Cutbanks cave Slow refill Depth to saturated zone	1.00 0.30 0.02
Lowe-----	35	Somewhat limited Seepage	0.70	Very limited Depth to saturated zone Piping	1.00 0.62	Very limited Cutbanks cave Slow refill	1.00 0.30
Na:							
Nahon-----	45	Somewhat limited Seepage	0.05	Very limited Piping Salinity	1.00 0.12	Very limited Cutbanks cave Slow refill Depth to saturated zone Salinity and saturated zone	1.00 0.95 0.90 0.50
Aberdeen-----	30	Somewhat limited Seepage	0.43	Somewhat limited Piping	0.78	Very limited Cutbanks cave Depth to saturated zone Slow refill Salinity and saturated zone	1.00 0.90 0.57 0.01
Exline-----	20	Not limited		Very limited Hard to pack Depth to saturated zone Salinity	1.00 0.84 0.12	Very limited Cutbanks cave Slow refill Salinity and saturated zone Depth to saturated zone	1.00 1.00 0.50 0.07
Nb:							
Nahon-----	45	Somewhat limited Seepage	0.05	Very limited Piping Salinity	1.00 0.12	Very limited Cutbanks cave Slow refill Depth to saturated zone Salinity and saturated zone	1.00 0.95 0.90 0.50
Aberdeen-----	30	Somewhat limited Seepage	0.43	Somewhat limited Piping	0.78	Very limited Cutbanks cave Slow refill Depth to saturated zone Salinity and saturated zone	1.00 0.95 0.90 0.01

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Nb: (cont.) Exline-----	20	Somewhat limited Seepage	0.05	Very limited Hard to pack Depth to saturated zone Salinity	1.00 0.84 0.12	Very limited Cutbanks cave Slow refill Salinity and saturated zone Depth to saturated zone	1.00 0.95 0.50 0.07
Nc: Niobell-----	60	Somewhat limited Seepage	0.05	Very limited Piping	1.00	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave Salinity and saturated zone	0.95 0.90 0.10 0.01
Noonan-----	30	Not limited		Somewhat limited Piping	0.89	Very limited Slow refill Depth to saturated zone Cutbanks cave Salinity and saturated zone	1.00 0.90 0.10 0.01
Nd: Niobell-----	40	Somewhat limited Seepage	0.05	Very limited Piping	1.00	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave Salinity and saturated zone	0.95 0.90 0.10 0.01
Noonan-----	30	Not limited		Somewhat limited Piping	0.89	Very limited Slow refill Depth to saturated zone Cutbanks cave Salinity and saturated zone	1.00 0.90 0.10 0.01
Heil-----	20	Not limited		Very limited Depth to saturated zone Hard to pack Ponding Salinity	1.00 1.00 1.00 0.12	Very limited Slow refill Salinity and saturated zone Cutbanks cave	1.00 0.50 0.10
NeA: Niobell-----	40	Somewhat limited Seepage	0.05	Very limited Piping	1.00	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave Salinity and saturated zone	0.95 0.90 0.10 0.01

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
NeA: (cont.) Noonan-----	30	Not limited		Somewhat limited Piping	0.89	Very limited Slow refill Depth to saturated zone Cutbanks cave Salinity and saturated zone	1.00 0.90 0.10 0.01
Max-----	20	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.82	Very limited Depth to water	1.00
Nm: Noonan-----	55	Not limited		Somewhat limited Piping	0.89	Very limited Slow refill Depth to saturated zone Cutbanks cave Salinity and saturated zone	1.00 0.90 0.10 0.01
Miranda-----	35	Not limited		Very limited Piping Salinity	1.00 0.12	Very limited Slow refill Depth to saturated zone Salinity and saturated zone Cutbanks cave	1.00 0.90 0.50 0.10
Nr: Northville-----	60	Somewhat limited Seepage	0.43	Somewhat limited Piping Salinity	0.78 0.12	Somewhat limited Depth to saturated zone Slow refill Salinity and saturated zone Cutbanks cave	0.81 0.57 0.50 0.10
Farmsworth-----	30	Somewhat limited Seepage	0.01	Very limited Piping Depth to saturated zone Salinity	1.00 0.95 0.12	Somewhat limited Slow refill Salinity and saturated zone Cutbanks cave Depth to saturated zone	0.99 0.50 0.10 0.02
Nv: Northville-----	40	Somewhat limited Seepage	0.43	Somewhat limited Piping Salinity	0.78 0.12	Somewhat limited Depth to saturated zone Slow refill Salinity and saturated zone Cutbanks cave	0.81 0.57 0.50 0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Nv: (cont.) Farmsworth-----	30	Somewhat limited Seepage	0.01	Very limited Piping Depth to saturated zone Salinity	1.00 0.95 0.12	Somewhat limited Slow refill Salinity and saturated zone Cutbanks cave Depth to saturated zone	0.99 0.50 0.10 0.02
Hoven-----	20	Not limited		Very limited Depth to saturated zone Hard to pack Ponding Salinity	1.00 1.00 1.00 0.12	Very limited Slow refill Salinity and saturated zone Cutbanks cave	1.00 0.50 0.10
Ov: Overshue-----	90	Very limited Seepage	1.00	Very limited Depth to saturated zone Piping Ponding	1.00 1.00 1.00	Somewhat limited Cutbanks cave	0.10
Pa: Parnell-----	90	Not limited		Very limited Ponding Depth to saturated zone Hard to pack	1.00 1.00 0.68	Somewhat limited Slow refill Cutbanks cave	0.95 0.10
Pc: Parshall-----	85	Very limited Seepage	1.00	Somewhat limited Seepage	0.11	Very limited Depth to water	1.00
PeA: Peever-----	85	Somewhat limited Seepage	0.01	Somewhat limited Hard to pack	0.05	Very limited Depth to water Slow refill	1.00 0.99
PgB: Peever-----	60	Somewhat limited Seepage	0.01	Somewhat limited Hard to pack	0.05	Very limited Depth to water Slow refill	1.00 0.99
Buse-----	30	Somewhat limited Slope Seepage	0.08 0.05	Somewhat limited Piping	0.85	Very limited Depth to water	1.00
PoA: Peever-----	60	Somewhat limited Seepage	0.01	Somewhat limited Hard to pack	0.05	Very limited Depth to water Slow refill	1.00 0.99
Cavour-----	30	Somewhat limited Seepage	0.01	Very limited Piping Salinity	1.00 0.50	Somewhat limited Slow refill Depth to saturated zone Salinity and saturated zone Cutbanks cave	0.99 0.90 0.78 0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Pp: Pits, gravel and sand-----	90	Very limited Seepage Slope	1.00 1.00	Somewhat limited Seepage	0.82	Very limited Depth to water	1.00
Pr: Playmoor-----	85	Somewhat limited Seepage	0.57	Very limited Depth to saturated zone Salinity Piping	1.00 0.12 0.07	Very limited Cutbanks cave Salinity and saturated zone Slow refill	1.00 0.50 0.43
Py: Playmoor, channeled--	50	Somewhat limited Seepage	0.57	Very limited Depth to saturated zone Salinity Piping	1.00 0.12 0.07	Very limited Cutbanks cave Salinity and saturated zone Slow refill	1.00 0.50 0.43
Lamoure, channeled--	40	Somewhat limited Seepage	0.57	Very limited Depth to saturated zone	1.00	Somewhat limited Slow refill Cutbanks cave	0.43 0.10
Ra: Ranslo-----	85	Somewhat limited Seepage	0.05	Very limited Piping Depth to saturated zone	1.00 0.99	Somewhat limited Slow refill Cutbanks cave Salinity and saturated zone Depth to saturated zone	0.95 0.10 0.01 0.01
Re: Ranslo-----	50	Somewhat limited Seepage	0.05	Very limited Piping Depth to saturated zone	1.00 0.99	Somewhat limited Slow refill Cutbanks cave Salinity and saturated zone Depth to saturated zone	0.95 0.10 0.01 0.01
Harriet-----	40	Somewhat limited Seepage	0.70	Very limited Depth to saturated zone Piping Salinity	1.00 1.00 0.12	Somewhat limited Salinity and saturated zone Slow refill Cutbanks cave	0.50 0.30 0.10
RfA: Renshaw-----	55	Very limited Seepage	1.00	Somewhat limited Seepage	0.10	Very limited Depth to water	1.00
Fordville-----	35	Very limited Seepage	1.00	Somewhat limited Seepage	0.82	Very limited Depth to water	1.00
RfB: Renshaw-----	60	Very limited Seepage Slope	1.00 0.08	Somewhat limited Seepage	0.10	Very limited Depth to water	1.00

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RfB: (cont.) Fordville-----	30	Very limited Seepage Slope	1.00 0.08	Somewhat limited Seepage	0.82	Very limited Depth to water	1.00
So: Southam-----	90	Somewhat limited Seepage	0.01	Very limited Ponding Depth to saturated zone Hard to pack	1.00 1.00 0.76	Somewhat limited Slow refill Cutbanks cave Salinity and saturated zone	0.95 0.10 0.01
St: Stickney-----	60	Somewhat limited Seepage	0.01	Somewhat limited Piping Salinity	0.78 0.12	Somewhat limited Slow refill Depth to saturated zone Salinity and saturated zone Cutbanks cave	0.99 0.90 0.50 0.10
Dudley-----	30	Somewhat limited Seepage	0.01	Very limited Piping Salinity	1.00 0.50	Somewhat limited Slow refill Depth to saturated zone Salinity and saturated zone Cutbanks cave	0.99 0.90 0.78 0.10
Su: Stickney-----	40	Somewhat limited Seepage	0.01	Somewhat limited Piping Salinity	0.78 0.12	Somewhat limited Slow refill Depth to saturated zone Salinity and saturated zone Cutbanks cave	0.99 0.90 0.50 0.10
Dudley-----	30	Somewhat limited Seepage	0.01	Very limited Piping Salinity	1.00 0.50	Somewhat limited Slow refill Depth to saturated zone Salinity and saturated zone Cutbanks cave	0.99 0.90 0.78 0.10
Hoven-----	20	Not limited		Very limited Depth to saturated zone Hard to pack Ponding Salinity	1.00 1.00 1.00 0.12	Very limited Slow refill Salinity and saturated zone Cutbanks cave	1.00 0.50 0.10
Sw: Straw, channeled----	85	Very limited Seepage	1.00	Very limited Piping	0.99	Somewhat limited Depth to saturated zone Cutbanks cave	0.90 0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Sx: Straw-----	90	Very limited Seepage	1.00	Very limited Piping	0.99	Somewhat limited Depth to saturated zone Cutbanks cave	0.90 0.10
TbE: Talmo, stony-----	45	Very limited Seepage Slope	1.00 1.00	Somewhat limited Seepage	0.08	Very limited Depth to water	1.00
Ethan, stony-----	35	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.59	Very limited Depth to water	1.00
Te: Tetonka-----	90	Somewhat limited Seepage	0.01	Very limited Depth to saturated zone Ponding	1.00 1.00	Somewhat limited Slow refill Cutbanks cave Salinity and saturated zone	0.30 0.10 0.01
Tk: Tokon-----	90	Very limited Seepage	1.00	Very limited Depth to saturated zone Piping Ponding Seepage	1.00 1.00 1.00 0.04	Somewhat limited Cutbanks cave	0.10
Tm: Tokon, wet-----	90	Very limited Seepage	1.00	Very limited Ponding Depth to saturated zone Piping Seepage	1.00 1.00 1.00 0.04	Somewhat limited Cutbanks cave	0.10
Tn: Tonka-----	90	Somewhat limited Seepage	0.57	Very limited Ponding Depth to saturated zone	1.00 1.00	Somewhat limited Slow refill Cutbanks cave	0.30 0.10
To: Tonka-----	60	Somewhat limited Seepage	0.57	Very limited Ponding Depth to saturated zone	1.00 1.00	Somewhat limited Slow refill Cutbanks cave	0.30 0.10
Rimlap-----	30	Somewhat limited Seepage	0.05	Very limited Depth to saturated zone Ponding	1.00 1.00	Somewhat limited Slow refill Cutbanks cave	0.95 0.10
Us: Udorthents, silty---	90	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.90	Very limited Depth to water	1.00

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Va: Valliers-----	60	Somewhat limited Seepage	0.05	Very limited Depth to saturated zone Piping	1.00 0.82	Somewhat limited Slow refill Cutbanks cave	0.95 0.10
Hamerly-----	30	Somewhat limited Seepage	0.70	Somewhat limited Depth to saturated zone Piping	0.84 0.56	Somewhat limited Slow refill Cutbanks cave Depth to saturated zone	0.95 0.10 0.07
VgA: Vang-----	85	Very limited Seepage	1.00	Somewhat limited Seepage	0.54	Very limited Depth to water	1.00
W: Water-----	100	Not rated		Not rated		Not rated	
WaA: Williams-----	50	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.01	Very limited Depth to water	1.00
Bowbells-----	40	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.59	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave	0.95 0.90 0.10
WaB: Williams-----	60	Somewhat limited Seepage Slope	0.70 0.32	Somewhat limited Piping	0.01	Very limited Depth to water	1.00
Bowbells-----	30	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.59	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave	0.95 0.90 0.10
WbA: Williams-----	45	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.01	Very limited Depth to water	1.00
Bowbells-----	25	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.59	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave	0.95 0.90 0.10
Tonka-----	20	Somewhat limited Seepage	0.57	Very limited Ponding Depth to saturated zone	1.00 1.00	Somewhat limited Slow refill Cutbanks cave	0.30 0.10
WbB: Williams-----	50	Somewhat limited Seepage Slope	0.70 0.32	Somewhat limited Piping	0.01	Very limited Depth to water	1.00

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WbB: (cont.) Bowbells-----	25	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.59	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave	0.95 0.90 0.10
Tonka-----	20	Somewhat limited Seepage	0.57	Very limited Ponding Depth to saturated zone	1.00 1.00	Somewhat limited Slow refill Cutbanks cave	0.30 0.10
WcA: Williams-----	55	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.01	Very limited Depth to water	1.00
Niobell-----	30	Somewhat limited Seepage	0.05	Very limited Piping	1.00	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave Salinity and saturated zone	0.95 0.90 0.10 0.01
WcB: Williams-----	60	Somewhat limited Seepage Slope	0.70 0.32	Somewhat limited Piping	0.01	Very limited Depth to water	1.00
Niobell-----	30	Somewhat limited Slope Seepage	0.08 0.05	Very limited Piping	1.00	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave Salinity and saturated zone	0.95 0.90 0.10 0.01
WdA: Williams-----	45	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.01	Very limited Depth to water	1.00
Niobell-----	25	Somewhat limited Seepage	0.05	Very limited Piping	1.00	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave Salinity and saturated zone	0.95 0.90 0.10 0.01
Tonka-----	20	Somewhat limited Seepage	0.57	Very limited Ponding Depth to saturated zone	1.00 1.00	Somewhat limited Slow refill Cutbanks cave	0.30 0.10
WhD: Williams-----	50	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.01	Very limited Depth to water	1.00

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WhD: (cont.)							
Vida-----	40	Very limited Slope Seepage	1.00 0.05	Somewhat limited Piping	0.70	Very limited Depth to water	1.00
WmB:							
Williams-----	50	Somewhat limited Seepage Slope	0.70 0.32	Somewhat limited Piping	0.01	Very limited Depth to water	1.00
Zahl-----	25	Somewhat limited Seepage Slope	0.70 0.32	Somewhat limited Piping	0.15	Very limited Depth to water	1.00
Bowbells-----	20	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.59	Somewhat limited Slow refill Depth to saturated zone Cutbanks cave	0.95 0.90 0.10
WmC:							
Williams-----	45	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.01	Very limited Depth to water	1.00
Zahl-----	30	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.15	Very limited Depth to water	1.00
Bowbells-----	20	Somewhat limited Seepage Slope	0.70 0.32	Somewhat limited Piping	0.59	Very limited Depth to water Slow refill	1.00 0.95
Wn:							
Winship-----	60	Somewhat limited Seepage	0.70	Somewhat limited Depth to saturated zone Piping	0.84 0.15	Somewhat limited Slow refill Cutbanks cave Depth to saturated zone	0.95 0.10 0.07
Tonka-----	30	Somewhat limited Seepage	0.57	Very limited Ponding Depth to saturated zone	1.00 1.00	Somewhat limited Slow refill Cutbanks cave	0.30 0.10
Wo:							
Winship-----	60	Somewhat limited Seepage	0.05	Somewhat limited Depth to saturated zone Piping	0.84 0.08	Somewhat limited Slow refill Cutbanks cave Depth to saturated zone	0.95 0.10 0.07
Tonka-----	30	Somewhat limited Seepage	0.57	Very limited Ponding Depth to saturated zone	1.00 1.00	Somewhat limited Slow refill Cutbanks cave	0.30 0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ws: Woonsocket-----	50	Very limited Seepage	1.00	Somewhat limited Piping	0.78	Somewhat limited Depth to saturated zone	0.81
						Cutbanks cave	0.10
						Salinity and saturated zone	0.06
Whitelake-----	35	Very limited Seepage	1.00	Somewhat limited Piping	0.78	Very limited Cutbanks cave	1.00
				Salinity	0.12	Depth to	0.81
				Seepage	0.03	saturated zone	
						Salinity and saturated zone	0.50
Wt: Worthing-----	90	Somewhat limited Seepage	0.05	Very limited Ponding	1.00	Somewhat limited Slow refill	0.95
				Depth to	1.00	Cutbanks cave	0.10
				saturated zone		Salinity and	0.01
				Hard to pack	0.18	saturated zone	
Ww: Worthing, ponded----	90	Somewhat limited Seepage	0.05	Very limited Ponding	1.00	Somewhat limited Slow refill	0.95
				Depth to	1.00	Cutbanks cave	0.10
				saturated zone		Salinity and	0.01
				Hard to pack	0.18	saturated zone	
ZaE: Zahill-----	85	Very limited Slope Seepage	1.00 0.05	Somewhat limited Piping	0.77	Very limited Depth to water	1.00
ZbC: Zahl-----	50	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.15	Very limited Depth to water	1.00
Max-----	40	Very limited Slope Seepage	1.00 0.05	Somewhat limited Piping	0.82	Very limited Depth to water	1.00
ZbD: Zahl-----	55	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.15	Very limited Depth to water	1.00
Max-----	35	Very limited Slope Seepage	1.00 0.05	Somewhat limited Piping	0.82	Very limited Depth to water	1.00
ZgD: Zell-----	55	Very limited Slope Seepage	1.00 0.70	Very limited Piping	1.00	Very limited Depth to water	1.00
Great Bend-----	35	Very limited Slope Seepage	1.00 0.70	Somewhat limited Piping	0.34	Very limited Depth to water	1.00

Engineering Properties

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Aa:												
Aastad-----	0-14	Loam	CL, ML	A-6, A-7	0	0-5	95-100	95-100	80-95	50-75	35-45	10-20
	14-29	Clay loam	CL	A-7	0	0-5	95-100	90-100	75-95	50-75	40-50	15-25
	29-80	Clay loam, loam	CL	A-6, A-7	0	0-5	95-100	85-100	75-95	55-75	35-50	12-25
Ab:												
Aastad-----	0-14	Loam	ML, CL	A-6, A-7	0	0-5	95-100	95-100	80-95	50-75	35-45	10-20
	14-29	Clay loam	CL	A-7	0	0-5	95-100	90-100	75-95	50-75	40-50	15-25
	29-80	Clay loam, loam	CL	A-6, A-7	0	0-5	95-100	85-100	75-95	55-75	35-50	12-25
Hamerly-----	0-9	Loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	90-100	80-95	60-90	20-40	5-20
	9-29	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-75	20-45	5-25
	29-80	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	75-95	55-75	20-45	5-25
Ad:												
Aastad-----	0-14	Loam	ML, CL	A-6, A-7	0	0-5	95-100	95-100	80-95	50-75	35-45	10-20
	14-29	Clay loam	CL	A-7	0	0-5	95-100	90-100	75-95	50-75	40-50	15-25
	29-80	Clay loam, loam	CL	A-6, A-7	0	0-5	95-100	85-100	75-95	55-75	35-50	12-25
Tonka-----	0-16	Silt loam	CL-ML, CL	A-6, A-4	0-1	0-2	100	95-100	90-100	70-90	35-45	15-25
	16-41	Silty clay loam, clay loam, silty clay	CH, CL	A-6, A-7	0-1	0-2	100	95-100	90-100	75-95	50-60	30-40
	41-80	Silty clay loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0-1	0-3	90-100	85-100	60-100	50-90	35-55	15-30
Ae:												
Aberdeen-----	0-11	Silt loam	ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-45	7-20
	11-23	Silty clay, clay, silty clay loam	ML, MH	A-7	0	0	100	100	95-100	90-100	45-75	15-40
	23-36	Silty clay loam, silty clay	CH, CL, ML, MH	A-6, A-7	0	0	100	100	95-100	85-100	35-65	15-30
	36-49	Stratified very fine sand to silt loam to clay	ML, CL-ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	85-100	20-50	3-25
	49-80	Clay loam, loam	CL	A-6, A-7	0-5	0-5	95-100	90-100	80-100	65-85	30-50	10-30

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Ae: (cont.)												
Nahon-----	0-7	Silt loam	CL, ML	A-4, A-6, A-7	0	0	100	100	90-100	80-100	30-45	5-20
	7-9	Silty clay loam, silt loam	CL, ML	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-25
	9-21	Silty clay, silty clay loam	CH, CL, MH, ML	A-7	0	0	100	100	95-100	90-100	45-65	15-35
	21-43	Silty clay, silty clay loam, silt loam	CL, MH, ML, CH	A-6, A-7	0	0	100	100	90-100	80-100	30-65	10-30
	43-49	Stratified very fine sand to silty clay loam to clay	ML, CH, CL, MH	A-7	0	0	100	100	90-100	75-100	40-70	15-35
	49-80	Clay loam, loam	CL	A-6, A-7	0-5	0-5	95-100	90-100	80-100	65-85	30-50	10-30
Ah:												
Aberdeen-----	0-13	Silty clay loam	ML, CL	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-25
	13-23	Silty clay, clay, silty clay loam	ML, MH	A-7	0	0	100	100	95-100	90-100	45-75	15-40
	23-39	Silty clay loam, silty clay	ML, MH, CL, CH	A-6, A-7	0	0	100	100	95-100	85-100	35-65	15-30
	39-80	Stratified very fine sand to silt loam to clay	ML, CL-ML, CL, CH	A-4, A-6, A-7	0	0	100	100	95-100	85-100	20-56	3-33
Nahon-----												
	0-7	Silt loam	CL, ML	A-4, A-6, A-7	0	0	100	100	90-100	80-100	30-45	5-20
	7-9	Silty clay loam, silt loam	CL, ML	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-25
	9-21	Silty clay, silty clay loam	ML, MH, CL, CH	A-7	0	0	100	100	95-100	90-100	45-65	15-35
	21-43	Silty clay, silty clay loam, silt loam	MH, CL, CH, ML	A-6, A-7	0	0	100	100	90-100	80-100	30-65	10-30
	43-49	Stratified very fine sand to silty clay loam to clay	CH, CL, MH, ML	A-7	0	0	100	100	90-100	75-100	40-70	15-35
	49-80	Clay loam, loam	CL	A-6, A-7	0-5	0-5	95-100	90-100	80-100	65-85	30-50	10-30
An:												
Aberdeen-----	0-13	Silt loam	ML, CL	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-25
	13-23	Silty clay, clay, silty clay loam	ML, MH	A-7	0	0	100	100	95-100	90-100	45-75	15-40
	23-39	Silty clay loam, silty clay	CL, CH, ML, MH	A-6, A-7	0	0	100	100	95-100	85-100	35-65	15-30
	39-80	Stratified very fine sand to silt loam to clay	CH, CL, CL- ML, ML	A-4, A-6, A-7	0	0	100	100	95-100	85-100	20-56	3-33

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
An: (cont.)												
Nahon-----	0-7	Silt loam	CL, ML	A-4, A-6, A-7	0	0	100	100	90-100	80-100	30-45	5-20
	7-9	Silty clay loam, silt loam	ML, CL	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-25
	9-21	Silty clay, silty clay loam	ML, MH, CL, CH	A-7	0	0	100	100	95-100	90-100	45-65	15-35
	21-43	Silty clay, silty clay loam, silt loam	ML, MH, CL, CH	A-6, A-7	0	0	100	100	90-100	80-100	30-65	10-30
	43-49	Stratified very fine sand to silty clay loam to clay	CH, CL, MH, ML	A-7	0	0	100	100	90-100	75-100	40-70	15-35
	49-80	Clay loam, loam	CL	A-6, A-7	0-5	0-5	95-100	90-100	80-100	65-85	30-50	10-30
Heil-----	0-2	Silt loam	CL	A-6, A-7	0	0	100	100	90-100	70-100	25-45	10-25
	2-24	Silty clay, clay	CH	A-7	0	0	100	100	90-100	75-100	50-75	25-45
	24-80	Silty clay, silty clay loam, clay loam	CH, CL	A-6, A-7	0	0	100	100	85-100	60-100	25-75	11-45
Ao:												
Aberdeen-----	0-11	Silt loam	CL, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-45	7-20
	11-23	Silty clay, clay, silty clay loam	ML, MH	A-7	0	0	100	100	95-100	90-100	45-75	15-40
	23-36	Silty clay loam, silty clay	CL, CH, ML, MH	A-6, A-7	0	0	100	100	95-100	85-100	35-65	15-30
	36-49	Stratified very fine sand to silt loam to clay	ML, CL-ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	85-100	20-50	3-25
	49-80	Clay loam, loam	CL	A-6, A-7	0-5	0-5	95-100	90-100	80-100	65-85	30-50	10-30
Nahon-----	0-7	Silt loam	ML, CL	A-4, A-6, A-7	0	0	100	100	90-100	80-100	30-45	5-20
	7-9	Silty clay loam, silt loam	CL, ML	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-25
	9-21	Silty clay, silty clay loam	ML, MH, CL, CH	A-7	0	0	100	100	95-100	90-100	45-65	15-35
	21-43	Silty clay, silty clay loam, silt loam	ML, MH, CL, CH	A-6, A-7	0	0	100	100	90-100	80-100	30-65	10-30
	43-49	Stratified very fine sand to silty clay loam to clay	CH, CL, MH, ML	A-7	0	0	100	100	90-100	75-100	40-70	15-35
	49-80	Clay loam, loam	CL	A-6, A-7	0-5	0-5	95-100	90-100	80-100	65-85	30-50	10-30

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Ao: (cont.)												
Heil-----	0-2	Silt loam	CL	A-6, A-7	0	0	100	100	90-100	70-100	25-45	10-25
	2-24	Silty clay, clay	CH	A-7	0	0	100	100	90-100	75-100	50-75	25-45
	24-47	Silty clay, silty clay loam, clay loam	CH, CL	A-6, A-7	0	0	100	100	85-100	60-100	25-75	11-45
	47-80	Silty clay, silty clay loam, clay loam	CL, CH	A-6, A-7	0	0	100	100	85-100	60-100	25-75	11-45
At:												
Aguents, loamy--	0-10	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-95	70-80	25-40	5-15
	10-80	Stratified very fine sand to clay	CL-ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	90-100	25-50	5-25
BaC:												
Beadle-----	0-7	Loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	95-100	85-100	65-95	25-45	5-20
	7-26	Clay loam, clay	CH, CL	A-7	0	0-5	90-100	85-100	75-95	55-95	40-60	15-35
	26-80	Clay loam, clay	CH, ML, MH, CL	A-6, A-7	0	0-5	90-100	85-100	75-95	55-85	35-55	15-25
BdA:												
Beadle-----	0-7	Loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	95-100	85-100	65-95	25-45	5-20
	7-26	Clay loam, clay	CH, CL	A-7	0	0-5	90-100	85-100	75-95	55-95	40-60	15-35
	26-80	Clay loam, clay	CH, CL, ML, MH	A-6, A-7	0	0-5	90-100	85-100	75-95	55-85	35-55	15-25
Dudley-----	0-7	Loam	ML, CL	A-6, A-7	0	0	95-100	95-100	90-100	70-90	35-45	10-20
	7-18	Clay loam, silty clay loam, clay	CL, CH	A-7	0	0	95-100	95-100	85-100	65-85	40-60	15-35
	18-39	Clay loam, clay, loam	CL, CH	A-6, A-7	0	0	95-100	95-100	85-100	65-85	35-60	15-35
	39-80	Clay loam, loam	CL, CH	A-6, A-7	0	0-5	95-100	90-100	80-100	55-80	30-60	11-35
BeA:												
Beadle-----	0-7	Loam	CL-ML, CL	A-4, A-6, A-7	0	0-5	95-100	95-100	85-100	65-95	25-45	5-20
	7-26	Clay loam, clay	CH, CL	A-7	0	0-5	90-100	85-100	75-95	55-95	40-60	15-35
	26-80	Clay loam, clay	CH, ML, MH, CL	A-6, A-7	0	0-5	90-100	85-100	75-95	55-85	35-55	15-25
Stickney-----	0-10	Silt loam	ML, CL	A-4, A-6, A-7	0	0	95-100	95-100	85-100	85-95	30-50	8-20
	10-22	Clay loam, silty clay loam, clay	CH, ML, MH, CL	A-7	0	0	95-100	95-100	85-100	65-95	40-60	14-34
	22-80	Clay loam, loam	CH, CL, ML, MH	A-6, A-7	0	0-5	95-100	90-100	80-100	55-90	35-60	10-35

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
BeB:												
Beadle-----	0-7	Loam	CL-ML, CL	A-4, A-6, A-7	0	0-5	95-100	95-100	85-100	65-95	25-45	5-20
	7-26	Clay loam, clay	CH, CL	A-7	0	0-5	90-100	85-100	75-95	55-95	40-60	15-35
	26-80	Clay loam, clay	ML, CH, CL, MH	A-6, A-7	0	0-5	90-100	85-100	75-95	55-85	35-55	15-25
Stickney-----	0-10	Silt loam	ML, CL	A-4, A-6, A-7	0	0	95-100	95-100	85-100	85-95	30-50	8-20
	10-22	Clay loam, silty clay loam, clay	ML, CL, CH, MH	A-7	0	0	95-100	95-100	85-100	65-95	40-60	14-34
	22-80	Clay loam, loam	ML, CL, CH, MH	A-6, A-7	0	0-5	95-100	90-100	80-100	55-90	35-60	10-35
BfA:												
Beadle, stony---	0-7	Loam	CL, CL-ML	A-4, A-6, A-7	0-5	3-20	95-100	95-100	85-100	65-95	25-45	5-20
	7-26	Clay loam, clay	CH, CL	A-7	0-2	0-15	90-100	85-100	75-95	55-95	40-60	15-35
	26-80	Clay loam, clay	MH, CH, ML, CL	A-6, A-7	0-1	0-5	90-100	85-100	75-95	55-85	35-55	15-25
Stickney, stony-	0-10	Silt loam	ML, CL	A-4, A-6, A-7	0	0	95-100	95-100	85-100	85-95	30-50	8-20
	10-22	Clay loam, silty clay loam, clay	ML, MH, CL, CH	A-7	0	0	95-100	95-100	85-100	65-95	40-60	14-34
	22-80	Clay loam, loam	CH, MH, ML, CL	A-6, A-7	0	0-5	95-100	90-100	80-100	55-90	35-60	10-35
BfB:												
Beadle, stony---	0-7	Loam	CL-ML, CL	A-4, A-6, A-7	0	0-5	95-100	95-100	85-100	65-95	25-45	5-20
	7-26	Clay loam, clay	CH, CL	A-7	0	0-5	90-100	85-100	75-95	55-95	40-60	15-35
	26-80	Clay loam, clay	CH, MH, CL, ML	A-6, A-7	0	0-5	90-100	85-100	75-95	55-85	35-55	15-25
Stickney, stony-	0-10	Silt loam	ML, CL	A-4, A-6, A-7	0	0	95-100	95-100	85-100	85-95	30-50	8-20
	10-22	Clay loam, silty clay loam, clay	MH, CL, CH, ML	A-7	0	0	95-100	95-100	85-100	65-95	40-60	14-34
	22-80	Clay loam, loam	ML, MH, CL, CH	A-6, A-7	0	0-5	95-100	90-100	80-100	55-90	35-60	10-35
Bg:												
Bearden-----	0-7	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	70-90	30-35	10-15
	7-16	Silt loam, silty clay loam	CL	A-4, A-6, A-7	0	0	100	100	90-100	80-95	30-45	10-20
	16-38	Silt loam, silty clay loam, loam	CL, CL-ML	A-4, A-6, A-7	0	0	100	100	90-100	80-95	30-45	10-20
	38-80	Silt loam, silty clay loam, silty clay	CH, CL, CL-ML	A-6, A-7	0	0	100	100	90-100	80-95	30-65	10-40

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Bk:												
Bearden-----	0-7	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	90-100	70-90	30-35	10-15
	7-16	Silt loam, silty clay loam	CL	A-4, A-6, A-7	0	0	100	100	90-100	80-95	30-45	10-20
	16-38	Silt loam, silty clay loam, loam	CL, CL-ML	A-4, A-6, A-7	0	0	100	100	90-100	80-95	30-45	10-20
	38-80	Silt loam, silty clay loam, silty clay	CL, CH, CL-ML	A-6, A-7	0	0	100	100	90-100	80-95	30-65	10-40
Tonka-----	0-16	Silt loam	CL-ML, CL	A-4, A-6	0-1	0-2	100	95-100	90-100	70-90	35-45	15-25
	16-41	Silty clay loam, clay loam, silty clay	CH, CL	A-6, A-7	0-1	0-2	100	95-100	90-100	75-95	50-60	30-40
	41-80	Silty clay loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0-1	0-3	90-100	85-100	60-100	50-90	35-55	15-30
Bo:												
Beotia-----	0-9	Silt loam	ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-45	5-20
	9-21	Silt loam, silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	90-100	32-50	10-20
	21-39	Silt loam, silty clay loam	CL, CL-ML, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	25-50	5-20
	39-80	Stratified very fine sand to silt loam to clay	ML, CL-ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	90-100	25-50	5-20
Br:												
Beotia-----	0-9	Silt loam	ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-45	5-20
	9-21	Silt loam, silty clay loam	ML, CL	A-6, A-7	0	0	100	100	95-100	90-100	32-50	10-20
	21-39	Silt loam, silty clay loam	ML, CL, CL-ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	25-50	5-20
	39-80	Stratified very fine sand to silt loam to clay	CL, CL-ML, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	25-50	5-20
Rondell-----	0-11	Silt loam	ML, CL	A-4, A-6	0	0	100	100	90-100	85-100	30-40	5-15
	11-36	Silt loam, silty clay loam	CL	A-4, A-6, A-7	0	0	100	100	90-100	85-100	30-50	8-25
	36-80	Stratified very fine sand to silt loam to clay	CL-ML, CL	A-4, A-6, A-7	0	0	100	100	90-100	80-100	25-50	5-25

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Bs:												
Beotia-----	0-9	Silt loam	CL, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-45	5-20
	9-21	Silt loam, silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	90-100	32-50	10-20
	21-39	Silt loam, silty clay loam	CL-ML, CL, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	25-50	5-20
	39-80	Stratified very fine sand to silt loam to clay	CL, CL-ML, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	25-50	5-20
Winship-----	0-25	Silt loam	CL, ML	A-4, A-6, A-7	0	0	100	100	90-100	85-100	30-45	7-20
	25-57	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	90-100	85-100	35-50	15-25
	57-80	Silt loam, silty clay loam	CL	A-6, A-7	0	0	100	100	90-100	85-100	30-50	10-25
Bt:												
Beotia-----	0-12	Silt loam	ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-45	5-20
	12-27	Silt loam, silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	90-100	30-50	10-20
	27-46	Silt loam, silty clay loam	CL-ML, ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	90-100	25-50	5-20
	46-52	Stratified very fine sand to silt loam to clay	ML, CL-ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	85-100	25-50	5-20
	52-80	Clay loam, loam	CL	A-6, A-7	0-5	0-5	95-100	90-100	80-100	65-85	30-50	10-30
Winship-----	0-18	Silt loam	ML, CL	A-4, A-6, A-7	0	0	100	100	90-100	85-100	30-45	7-20
	18-41	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	90-100	85-100	35-50	15-25
	41-57	Silt loam, silty clay loam	CL	A-6, A-7	0	0	100	100	90-100	85-100	30-50	10-25
	57-80	Clay loam, loam	CL	A-6, A-7	0-5	0-5	95-100	90-100	80-100	65-85	30-50	10-30
Bu:												
Bon-----	0-26	Loam	CL-ML, CL	A-4, A-6	0	0	100	95-100	80-95	55-85	25-40	5-15
	26-49	Stratified fine sandy loam to silty clay loam	ML, CL-ML, CL	A-4, A-6	0	0	100	95-100	80-95	60-85	23-40	3-15
	49-80	Stratified loamy fine sand to silty clay loam	SC, SM, ML, CL	A-4, A-6, A-7	0	0	95-100	95-100	75-95	45-95	25-45	3-22

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Bw:												
Bon, channeled--	0-26	Loam	CL, CL-ML	A-4, A-6	0	0	100	95-100	80-95	55-85	25-40	5-15
	26-49	Stratified fine sandy loam to silty clay loam	CL, ML, CL-ML	A-4, A-6	0	0	100	95-100	80-95	60-85	23-40	3-15
	49-80	Stratified loamy fine sand to silty clay loam	CL, ML, SC, SM	A-4, A-6, A-7	0	0	95-100	95-100	75-95	45-95	25-45	3-22
BxD:												
Buse-----	0-7	Loam	CL-ML, ML, CL	A-4, A-6	0	0	90-100	85-95	70-95	55-90	20-35	3-15
	7-35	Loam, clay loam	CL, CL-ML, ML	A-4, A-6, A-7	0	0	90-100	85-100	70-90	55-85	25-45	5-20
	35-80	Loam, clay loam	ML, CL-ML, CL	A-4, A-6, A-7	0	0	90-100	85-100	70-90	55-85	25-45	5-20
Barnes-----	0-7	Loam	CL, CL-ML	A-4, A-6	0	0-5	90-100	85-100	80-100	60-80	25-35	10-20
	7-15	Loam, clay loam	CL, CL-ML	A-4, A-6	0	0-5	90-100	85-100	75-95	55-80	25-45	10-25
	15-38	Loam, clay loam	CL, CL-ML	A-4, A-6	0	0-5	90-100	85-100	75-95	55-80	25-45	10-25
	38-80	Loam, clay loam	CL, CL-ML	A-4, A-6	0	0-5	90-100	85-100	75-95	55-80	25-45	10-25
ByE:												
Buse, stony-----	0-7	Loam	ML, CL	A-4, A-6	0-70	0-70	90-100	85-95	70-90	55-80	30-40	5-15
	7-35	Loam, clay loam	CL	A-4, A-6	0-30	0-30	90-100	85-95	70-90	60-80	25-40	8-15
	35-80	Loam, clay loam	CL	A-4, A-6	0-30	0-30	90-100	85-95	70-90	60-80	25-40	8-15
Barnes, stony---	0-7	Loam	CL	A-6	0-5	3-25	90-100	85-100	80-100	60-75	25-40	10-20
	7-15	Loam, clay loam	CL-ML, CL	A-4, A-6	0-5	0-20	90-100	85-100	75-95	60-80	25-40	5-20
	15-80	Loam, clay loam	CL, CL-ML	A-4, A-6	0-5	0-15	90-100	85-100	75-95	60-80	25-40	5-20
BzE:												
Buse-----	0-7	Loam	CL, CL-ML, ML	A-4, A-6	0	0	90-100	85-95	70-95	55-90	20-35	3-15
	7-35	Loam, clay loam	CL-ML, ML, CL	A-4, A-6, A-7	0	0	90-100	85-100	70-90	55-85	25-45	5-20
	35-80	Loam, clay loam	ML, CL-ML, CL	A-4, A-6, A-7	0	0	90-100	85-100	70-90	55-85	25-45	5-20
Langhei-----	0-4	Clay loam	CL, ML	A-6, A-7	0	0	95-100	90-100	75-95	70-80	35-45	10-20
	4-15	Clay loam, silty clay loam, loam	ML, CL	A-6, A-7	0	0	95-100	90-100	75-95	70-80	35-45	10-20
	15-80	Clay loam, silty clay loam, loam	ML, CL	A-6, A-7	0	0	95-100	90-100	75-95	70-80	35-45	10-20

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Ca:												
Camtown-----	0-14	Loam	CL-ML, CL	A-4, A-6	0	0	100	100	90-100	65-80	25-40	5-15
	14-19	Loam, very fine sandy loam, fine sandy loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	50-80	20-40	5-15
	19-36	Loam, clay loam, silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	80-95	30-45	10-20
	36-48	Loam, silt loam, very fine sandy loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	80-90	25-40	5-15
	48-80	Very fine sandy loam, loam, silt loam	CL, CL-ML	A-4, A-6	0	0	100	95-100	90-100	50-90	20-40	5-15
Turton-----	0-8	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	60-75	20-35	5-15
	8-10	Very fine sandy loam, fine sandy loam, loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	100	90-100	40-70	15-30	NP-7
	10-24	Loam, clay loam, silty clay loam	CL, ML	A-4, A-6	0	0	100	100	90-100	65-85	30-40	6-15
	24-38	Loam, silt loam, fine sandy loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	100	90-100	45-80	20-35	5-15
	38-80	Very fine sandy loam, loam, silt loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	100	90-100	45-85	15-35	5-15
Cf:												
Cavour-----	0-9	Loam	CL, ML	A-4, A-6, A- 7-6	0	0	100	90-100	85-100	60-85	30-45	6-20
	9-22	Clay, clay loam, silty clay	CH, CL	A-6, A-7	0	0	100	90-100	85-100	60-85	30-55	10-35
	22-45	Clay loam, clay, loam	CH, CL	A-6, A-7	0	0	95-100	90-100	75-100	50-85	35-65	12-35
	45-80	Clay loam, loam	CH, CL	A-6, A-7	0	0-5	95-100	90-100	75-100	50-85	35-65	12-35
Ferney-----	0-3	Loam	CL	A-6	0	0	100	95-100	85-95	60-85	30-40	10-20
	3-16	Clay loam, clay	ML, MH, CH, CL	A-7	0	0-5	95-100	95-100	85-100	70-80	40-65	15-30
	16-80	Clay loam, clay	CL, CH	A-7	0	0-5	95-100	95-100	85-100	70-80	40-60	15-30
Co:												
Colvin, saline--	0-14	Silty clay loam	CH, CL	A-6, A-7	0	0	100	100	90-100	80-95	30-50	15-30
	14-80	Silt loam, silty clay loam	CL	A-6, A-7	0	0	100	100	90-100	80-95	20-50	10-30

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Cr:												
Cresbard-----	0-8	Loam	CL	A-6	0	0	100	90-100	85-100	60-80	30-40	10-20
	8-11	Clay loam, silty clay loam	CL, ML	A-6, A-7	0	0	100	90-100	90-100	70-85	35-50	10-25
	11-22	Clay loam, silty clay, clay	CH, CL	A-6, A-7	0	0	95-100	90-100	85-100	65-85	30-60	15-30
	22-38	Clay loam, silty clay, clay	CH, CL	A-7	0	0	95-100	90-100	85-100	65-85	40-60	15-30
	38-80	Clay loam, loam, silt loam	CL, CH, ML, MH	A-6, A-7	0	0-5	95-100	90-100	85-100	50-95	25-55	10-25
Cavour-----	0-9	Loam	ML, CL	A-4, A-6, A- 7-6	0	0	100	90-100	85-100	60-85	30-45	6-20
	9-22	Clay, clay loam, silty clay	CL, CH	A-6, A-7	0	0	100	90-100	85-100	60-85	30-55	10-35
	22-45	Clay loam, clay, loam	CH, CL	A-6, A-7	0	0	95-100	90-100	75-100	50-85	35-65	12-35
	45-80	Clay loam, loam	CH, CL	A-6, A-7	0	0-5	95-100	90-100	75-100	50-85	35-65	12-35
Cs:												
Cresbard-----	0-8	Loam	CL	A-6	0	0	100	90-100	85-100	60-80	30-40	10-20
	8-11	Clay loam, silty clay loam	CL, ML	A-6, A-7	0	0	100	90-100	90-100	70-85	35-50	10-25
	11-22	Clay loam, silty clay, clay	CH, CL	A-6, A-7	0	0	95-100	90-100	85-100	65-85	30-60	15-30
	22-38	Clay loam, silty clay, clay	CL, CH	A-7	0	0	95-100	90-100	85-100	65-85	40-60	15-30
	38-80	Clay loam, loam, silt loam	CL, CH, ML, MH	A-6, A-7	0	0-5	95-100	90-100	85-100	50-95	25-55	10-25
Cavour-----	0-9	Loam	CL, ML	A-4, A-6, A- 7-6	0	0	100	90-100	85-100	60-85	30-45	6-20
	9-22	Clay, clay loam, silty clay	CH, CL	A-6, A-7	0	0	100	90-100	85-100	60-85	30-55	10-35
	22-45	Clay loam, clay, loam	CL, CH	A-6, A-7	0	0	95-100	90-100	75-100	50-85	35-65	12-35
	45-80	Clay loam, loam	CH, CL	A-6, A-7	0	0-5	95-100	90-100	75-100	50-85	35-65	12-35
Heil-----	0-2	Silt loam	CL	A-6, A-7	0	0	100	100	90-100	70-100	25-45	10-25
	2-24	Silty clay, clay	CH	A-7	0	0	100	100	90-100	75-100	50-75	25-45
	24-80	Silty clay, silty clay loam, clay loam	CL, CH	A-6, A-7	0	0	100	100	85-100	60-100	25-75	11-45

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Ct:												
Crossplain-----	0-15	Loam	CL, ML	A-6, A-7	0	0	100	100	90-100	60-85	30-50	10-20
	15-30	Clay loam, clay	CH, CL	A-7	0	0	100	95-100	90-100	70-90	40-55	15-30
	30-59	Clay loam, loam	CL	A-6, A-7	0	0	95-100	95-100	85-100	60-80	30-45	10-25
	59-80	Clay loam, loam	CL	A-6, A-7	0	0-5	95-100	95-100	85-100	60-80	30-45	10-25
Tetonka-----	0-13	Silt loam	ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	80-100	27-50	8-20
	13-39	Clay, silty clay, clay loam	ML, MH, CL, CH	A-7	0	0	95-100	95-100	85-100	65-100	40-70	15-35
	39-80	Clay loam, silty clay, clay	CL, CH	A-6, A-7	0	0	95-100	95-100	80-100	55-95	30-60	11-30
Da:												
Davis-----	0-6	Loam	ML, CL	A-4, A-6, A-7	0	0	100	90-100	80-100	60-85	30-45	5-20
	6-28	Loam, silt loam, clay loam	CL, ML	A-7, A-4, A-6	0	0	100	90-100	80-100	60-85	30-45	5-20
	28-80	Loam, clay loam, silt loam	CL, ML	A-4, A-6, A-7	0	0	100	95-100	85-100	55-90	30-45	5-20
Northville-----	0-5	Silt loam	CL, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-45	7-20
	5-8	Silt loam, silty clay loam	CH, CL, MH, ML	A-7	0	0	100	100	90-100	85-100	40-70	15-35
	8-22	Silty clay, clay, silty clay loam	ML, MH	A-7	0	0	100	100	95-100	90-100	45-75	15-40
	22-58	Silty clay loam, silt loam, silty clay	CH, CL, ML, MH	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-55	7-30
	58-80	Silty clay loam, clay loam, silty clay	CH, CL, MH, ML	A-4, A-6, A-7	0	0	100	100	95-100	85-100	30-55	7-30
Db:												
Davison-----	0-8	Loam	CL	A-6	0	0	95-100	95-100	85-95	60-85	25-40	10-20
	8-28	Loam, clay loam, sandy loam	CL, CL-ML, SC-SM, SC	A-4, A-6	0	0-5	95-100	95-100	85-100	45-80	25-40	5-20
	28-53	Loam, clay loam	CL-ML, CL	A-4, A-6	0	0-5	95-100	95-100	85-100	60-80	25-40	5-20
	53-80	Stratified sandy loam to clay loam	SC, SC-SM, CL-ML, CL	A-4, A-6	0	0-5	90-100	80-100	65-95	40-75	20-35	5-15
Dd:												
Davison-----	0-8	Loam	CL	A-6	0	0	95-100	95-100	85-95	60-85	25-40	10-20
	8-28	Loam, clay loam, sandy loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0-5	95-100	95-100	85-100	45-80	25-40	5-20
	28-53	Loam, clay loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	95-100	85-100	60-80	25-40	5-20
	53-80	Stratified sandy loam to clay loam	SC-SM, SC, CL-ML, CL	A-4, A-6	0	0-5	90-100	80-100	65-95	40-75	20-35	5-15

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Dd: (cont.) Tetonka-----	0-13	Silt loam	ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	80-100	27-50	8-20
	13-39	Clay, silty clay, clay loam	CH, CL, MH, ML	A-7	0	0	95-100	95-100	85-100	65-100	40-70	15-35
	39-80	Clay loam, silty clay, clay	CL, CH	A-6, A-7	0	0	95-100	95-100	80-100	55-95	30-60	11-30
DeA: Delmont-----	0-7	Loam	CL	A-6, A-4	0	0	90-100	90-100	80-95	60-75	28-40	8-20
	7-16	Loam, fine sandy loam, sandy loam	CL-ML, CL, SC, SC-SM	A-4, A-6	0	0	80-100	70-100	50-100	35-70	20-40	5-18
	16-80	Very gravelly sand, gravelly loamy sand, gravelly sand	SW-SM, SM, SW, SC-SM	A-1, A-2	0	0-5	60-100	40-80	15-50	3-30	15-25	NP-5
Enet-----	0-7	Loam	ML, CL	A-4, A-6	0	0	100	100	85-95	55-80	30-40	5-15
	7-15	Loam, clay loam, sandy clay loam	SC, ML, CL, SM	A-4, A-6	0	0	90-100	85-100	70-95	45-75	30-40	5-15
	15-28	Loam, fine sandy loam, sandy loam	CL, SM, ML, SC	A-4, A-6	0	0	90-100	85-95	60-95	40-75	20-40	3-15
	28-80	Gravelly loamy sand, gravelly sand, very gravelly loamy sand	SM, SC-SM, SW, SW-SM	A-1, A-2, A-3	0	0	60-95	45-90	10-60	0-15	15-25	NP-5
Dk: Dimo-----	0-7	Loam	CL	A-4, A-6	0	0	100	100	85-100	60-80	30-40	8-15
	7-31	Clay loam, loam, sandy clay loam	CL	A-6, A-7	0	0	90-100	85-100	85-95	50-80	35-45	12-20
	31-80	Gravelly sand, gravelly loamy sand, very gravelly loamy sand	SW-SM, SC-SM, SM, SP-SM	A-1, A-2, A-3	0	0-5	60-90	40-70	20-60	5-30	15-25	NP-5
Dm: Dimo-----	0-7	Loam	CL	A-4, A-6	0	0	100	100	85-100	60-80	30-40	8-15
	7-31	Clay loam, loam, sandy clay loam	CL	A-6, A-7	0	0	90-100	85-100	85-95	50-80	35-45	12-20
	31-80	Gravelly sand, gravelly loamy sand, very gravelly loamy sand	SC-SM, SM, SP-SM, SW-SM	A-1, A-2, A-3	0	0-5	60-90	40-70	20-60	5-30	15-25	NP-5

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Dm: (cont.)												
Grat-----	0-9	Loam	CL	A-4, A-6, A-7	0	0	100	100	90-100	60-80	30-45	8-20
	9-27	Clay loam, clay, silty clay	CH, CL, MH, ML	A-7	0	0	100	100	90-100	70-95	45-65	15-35
	27-57	Gravelly sand, gravelly loamy sand	SC-SM, SM, SW, SW-SM	A-1	0	0	60-100	45-80	15-45	0-15	15-25	NP-5
	57-80	Clay loam, loam, silty clay loam	CL	A-6, A-7	0	0	100	95-100	85-100	60-85	35-50	12-25
DoA:												
Doland-----	0-7	Loam	CL-ML, ML, CL	A-4, A-6	0	0	100	100	85-95	60-75	28-35	9-15
	7-28	Silt loam, loam	CL, ML	A-4, A-6	0	0	100	100	85-100	60-90	25-40	7-15
	28-80	Loam, clay loam	CL	A-6, A-7	0	0	90-100	85-95	80-90	55-80	30-45	10-20
Embdn-----	0-15	Fine sandy loam	CL-ML, SC, SC-SM	A-2, A-4	0	0	100	100	60-95	30-75	20-30	4-10
	15-38	Fine sandy loam, sandy loam	SC, SC-SM, CL-ML	A-2, A-4	0	0	100	100	60-100	25-55	20-30	5-10
	38-80	Sandy loam, sand, loamy sand	SC, SM, CL-ML	A-2, A-4	0	0	100	100	50-100	15-55	15-30	NP-10
Dq:												
Dovecreek-----	0-16	Silt loam	ML, CL	A-4, A-6, A-7	0	0	100	100	90-100	80-100	30-40	7-20
	16-30	Silt loam, silty clay loam	ML, CL, CH	A-6, A-7	0	0	100	100	90-100	75-100	30-55	10-25
	30-80	Silt loam, silty clay loam	CL, CL-ML	A-4, A-6, A-7	0	0	100	100	90-100	75-100	25-50	10-25
Dr:												
Dovray-----	0-16	Silty clay	CH, OH, MH	A-7	0	0	100	100	95-100	85-95	56-76	33-49
	16-40	Clay, silty clay	MH, CH	A-7	0	0	100	100	95-100	85-95	56-76	33-49
	40-60	Clay, silty clay loam, clay loam	CH, CL, MH	A-7	0	0	100	100	80-100	70-95	41-76	21-49
Du:												
Dudley-----	0-7	Loam	CL, ML	A-6, A-7	0	0	95-100	95-100	90-100	70-90	35-45	10-20
	7-18	Clay loam, silty clay loam, clay	CL, CH	A-7	0	0	95-100	95-100	85-100	65-85	40-60	15-35
	18-39	Clay loam, clay, loam	CL, CH	A-6, A-7	0	0	95-100	95-100	85-100	65-85	35-60	15-35
	39-80	Clay loam, loam	CH, CL	A-6, A-7	0	0-5	95-100	90-100	80-100	55-80	30-60	11-35

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Du: (cont.) Jerauld-----	0-2	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	60-100	25-40	5-15
	2-14	Silty clay, clay, clay loam	CH, CL	A-7	0	0	95-100	95-100	90-100	55-95	45-70	20-40
	14-33	Silty clay, clay, clay loam	CL, CH	A-7	0	0	95-100	95-100	90-100	55-95	45-70	20-40
	33-80	Silty clay, clay, clay loam	MH, ML, CL, CH	A-7	0	0	95-100	95-100	85-100	55-90	40-85	20-45
Dx: Durrstein-----	0-2	Silt loam	CL, ML, CL-ML	A-4, A-6	0	0	100	100	85-100	60-90	20-35	3-15
	2-14	Silty clay, clay, clay loam	CH, MH	A-7	0	0	95-100	95-100	85-100	65-95	50-85	20-50
	14-80	Silty clay, clay, silty clay loam	CH, CL	A-7	0	0	95-100	95-100	85-100	60-95	40-75	15-50
Ea: Eckman-----	0-7	Very fine sandy loam	ML	A-4	0	0	100	100	85-100	55-70	20-35	NP-10
	7-39	Silt loam, very fine sandy loam	ML	A-4	0	0	100	100	85-100	55-90	20-40	NP-10
	39-80	Silt loam, very fine sandy loam, fine sandy loam	ML, SM	A-4	0	0	100	100	65-100	40-90	20-40	NP-10
EcA: Eckman-----	0-7	Very fine sandy loam	ML	A-4	0	0	100	100	85-100	55-70	20-35	NP-10
	7-39	Silt loam, very fine sandy loam	ML	A-4	0	0	100	100	85-100	55-90	20-40	NP-10
	39-80	Silt loam, very fine sandy loam, fine sandy loam	ML, SM	A-4	0	0	100	100	65-100	40-90	20-40	NP-10
Gardena-----	0-20	Very fine sandy loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	85-100	55-70	15-30	NP-15
	20-80	Very fine sandy loam, loamy very fine sand	SM, CL-ML, ML	A-2-4, A-4, A-6	0	0	100	100	75-100	40-100	10-40	NP-15
EcB: Eckman-----	0-7	Very fine sandy loam	ML	A-4	0	0	100	100	85-100	55-70	20-35	NP-10
	7-39	Silt loam, very fine sandy loam	ML	A-4	0	0	100	100	85-100	55-90	20-40	NP-10
	39-80	Silt loam, very fine sandy loam, fine sandy loam	ML, SM	A-4	0	0	100	100	65-100	40-90	20-40	NP-10

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
EcB: (cont.)												
Gardena-----	0-20	Very fine sandy loam	ML, CL-ML, CL	A-4, A-6	0	0	100	100	85-100	55-70	15-30	NP-15
	20-80	Very fine sandy loam, loamy very fine sand	SM, CL-ML, ML	A-2-4, A-4, A-6	0	0	100	100	75-100	40-100	10-40	NP-15
EdB:												
Eckman-----	0-7	Very fine sandy loam	ML	A-4	0	0	100	100	85-100	55-70	20-35	NP-10
	7-39	Silt loam, very fine sandy loam	ML	A-4	0	0	100	100	85-100	55-90	20-40	NP-10
	39-80	Silt loam, very fine sandy loam, fine sandy loam	ML, SM	A-4	0	0	100	100	65-100	40-90	20-40	NP-10
Zell-----	0-7	Very fine sandy loam	ML	A-4	0	0	100	100	85-100	55-70	20-35	NP-10
	7-31	Silt loam, very fine sandy loam, loam	CL, CL-ML	A-4, A-6	0	0	100	95-100	85-100	70-100	25-40	5-15
	31-80	Silt loam, very fine sandy loam, loam	ML, CL-ML	A-4	0	0	100	95-100	85-100	60-100	15-25	NP-7
EeB:												
Edgeley-----	0-8	Loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	95-100	85-95	60-75	20-40	5-25
	8-25	Clay loam, silty clay loam, loam	CL, CH, MH	A-6, A-7	0	0-5	80-100	75-100	65-95	55-95	25-75	10-40
	25-80	Weathered bedrock			---	---	---	---	---	---	---	---
EeC:												
Edgeley-----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0-5	95-100	95-100	85-95	60-75	20-40	5-25
	8-25	Clay loam, silty clay loam, loam	CL, MH, CH	A-6, A-7	0	0-5	80-100	75-100	65-95	55-95	25-75	10-40
	25-80	Weathered bedrock			---	---	---	---	---	---	---	---
EeD:												
Edgeley-----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0-5	95-100	95-100	85-95	60-75	20-40	5-25
	8-25	Clay loam, silty clay loam, loam	CL, MH, CH	A-6, A-7	0	0-5	80-100	75-100	65-95	55-95	25-75	10-40
	25-80	Weathered bedrock			---	---	---	---	---	---	---	---
EgA:												
Egeland-----	0-8	Sandy loam	SC-SM, SM	A-2, A-4	0	0	100	95-100	75-100	30-50	15-25	NP-7
	8-31	Sandy loam, fine sandy loam	SC-SM, SM	A-2, A-4	0	0	95-100	85-100	70-100	15-50	15-25	NP-7
	31-64	Loamy sand, loamy fine sand, loamy very fine sand	SP-SM, SC-SM, SM	A-2, A-4	0	0	95-100	85-100	70-100	10-45	15-25	NP-5
	64-80	Stratified fine sand to silt loam	ML, SC-SM, SM	A-2, A-4	0	0	95-100	85-100	65-90	30-80	15-25	NP-5

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
EgA: (cont.) Embdn-----	0-15	Fine sandy loam	SC, SC-SM, CL-ML	A-2, A-4	0	0	100	100	60-95	30-75	20-30	4-10
	15-38	Fine sandy loam, sandy loam	CL-ML, SC, SC-SM	A-4, A-2	0	0	100	100	60-100	25-55	20-30	5-10
	38-80	Sandy loam, sand, loamy sand	CL-ML, SC, SM	A-2, A-4	0	0	100	100	50-100	15-55	15-30	NP-10
EgB: Egeland-----	0-8	Sandy loam	SM, SC-SM	A-2, A-4	0	0	100	95-100	75-100	30-50	15-25	NP-7
	8-31	Sandy loam, fine sandy loam	SC-SM, SM	A-2, A-4	0	0	95-100	85-100	70-100	15-50	15-25	NP-7
	31-64	Loamy sand, loamy fine sand, loamy very fine sand	SP-SM, SM, SC-SM	A-2, A-4	0	0	95-100	85-100	70-100	10-45	15-25	NP-5
	64-80	Stratified fine sand to silt loam	ML, SC-SM, SM	A-2, A-4	0	0	95-100	85-100	65-90	30-80	15-25	NP-5
Embdn-----	0-15	Fine sandy loam	SC-SM, SC, CL-ML	A-2, A-4	0	0	100	100	60-95	30-75	20-30	4-10
	15-38	Fine sandy loam, sandy loam	SC-SM, CL-ML, SC	A-4, A-2	0	0	100	100	60-100	25-55	20-30	5-10
	38-80	Sandy loam, sand, loamy sand	CL-ML, SC, SM	A-2, A-4	0	0	100	100	50-100	15-55	15-30	NP-10
Ek: Elsmere-----	0-19	Loamy sand	SC-SM, SM	A-2, A-4	0	0	100	90-100	50-75	15-45	15-25	NP-5
	19-46	Fine sand, loamy fine sand, loamy sand	SM, SC-SM	A-2, A-4	0	0	100	90-100	50-75	15-45	15-25	NP-5
	46-80	Clay loam, loam, fine sandy loam	SC, SC-SM, CL-ML, CL	A-4, A-6, A-7	0	0	100	90-100	60-100	45-90	25-45	5-20
EmE: Ethan-----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0-5	95-100	90-100	85-100	55-85	25-40	5-20
	8-20	Loam, clay loam	CL	A-6, A-7	0-3	0-5	95-100	90-100	80-100	55-80	30-50	10-25
	20-32	Loam, clay loam	CL	A-4, A-6, A-7	0-3	0-5	90-100	85-100	75-100	50-95	28-45	8-20
	32-60	Loam, clay loam	CL	A-4, A-6, A-7	0-3	0-5	90-100	85-100	75-100	50-95	28-45	8-20
Betts-----	0-3	Loam	CL	A-6	0-1	0-5	90-100	80-100	75-100	60-75	30-40	10-20
	3-29	Loam, clay loam	CL	A-6, A-7	0-1	0-5	90-100	85-100	75-100	50-85	30-45	10-25
	29-80	Clay loam, loam	CL	A-6, A-7	0-1	0-5	90-100	85-100	75-100	50-85	30-45	10-25

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
EnD:												
Ethan-----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0-5	95-100	90-100	85-100	55-85	25-40	5-20
	8-20	Loam, clay loam	CL	A-6, A-7	0-3	0-5	95-100	90-100	80-100	55-80	30-50	10-25
	20-32	Loam, clay loam	CL	A-4, A-6, A-7	0-3	0-5	90-100	85-100	75-100	50-95	28-45	8-20
	32-60	Loam, clay loam	CL	A-4, A-6, A-7	0-3	0-5	90-100	85-100	75-100	50-95	28-45	8-20
Hand-----	0-7	Loam	CL-ML, CL	A-4, A-6	0	0	95-100	85-100	75-100	50-85	25-40	5-20
	7-18	Loam, silt loam	CL-ML, CL	A-4, A-6	0	0	95-100	85-100	75-100	50-85	25-40	5-20
	18-35	Loam, clay loam, silt loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	80-100	75-100	50-80	25-40	5-20
	35-80	Stratified fine sandy loam to silt loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	80-100	70-100	50-80	25-40	5-15
Er:												
Exline-----	0-2	Silt loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-45	10-20
	2-21	Clay, silty clay, silty clay loam	CH, MH	A-7	0	0	100	100	95-100	90-100	60-90	30-50
	21-40	Silty clay loam, silty clay, clay	MH, CH	A-7	0	0	100	100	95-100	85-100	50-80	20-45
	40-80	Stratified very fine sand to silty clay loam to clay	CH, CL	A-7	0	0	100	100	95-100	85-100	40-60	15-30
Aberdeen-----	0-13	Silt loam	ML, CL	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-25
	13-23	Silty clay, clay, silty clay loam	MH, ML	A-7	0	0	100	100	95-100	90-100	45-75	15-40
	23-39	Silty clay loam, silty clay	ML, MH, CL, CH	A-6, A-7	0	0	100	100	95-100	85-100	35-65	15-30
	39-80	Stratified very fine sand to silt loam to clay	CH, CL, CL- ML, ML	A-4, A-6, A-7	0	0	100	100	95-100	85-100	20-56	3-33
Nahon-----	0-7	Silt loam	ML, CL	A-4, A-6, A-7	0	0	100	100	90-100	80-100	30-45	5-20
	7-9	Silty clay loam, silt loam	CL, ML	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-25
	9-21	Silty clay, silty clay loam	ML, MH, CL, CH	A-7	0	0	100	100	95-100	90-100	45-65	15-35
	21-43	Silty clay, silty clay loam, silt loam	ML, MH, CL, CH	A-6, A-7	0	0	100	100	90-100	80-100	30-65	10-30
	43-49	Stratified very fine sand to silty clay loam to clay	CL, CH, MH, ML	A-7	0	0	100	100	90-100	75-100	40-70	15-35
	49-80	Clay loam, loam	CL	A-6, A-7	0-5	0-5	95-100	90-100	80-100	65-85	30-50	10-30

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Et:												
Exline-----	0-2	Silt loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-45	10-20
	2-24	Clay, silty clay, silty clay loam	CH, MH	A-7	0	0	100	100	95-100	90-100	60-90	30-50
	24-39	Silty clay loam, silty clay, clay	CH, MH	A-7	0	0	100	100	95-100	85-100	50-80	20-45
	39-55	Stratified very fine sand to silty clay loam to clay	CH, CL	A-7	0	0	100	100	95-100	85-100	40-60	15-30
	55-80	Clay loam, loam	CL	A-6, A-7	0-5	0-5	95-100	90-100	80-100	65-85	30-50	10-30
Aberdeen-----	0-11	Silt loam	ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-45	7-20
	11-23	Silty clay, clay, silty clay loam	MH, ML	A-7	0	0	100	100	95-100	90-100	45-75	15-40
	23-36	Silty clay loam, silty clay	CL, CH, MH, ML	A-6, A-7	0	0	100	100	95-100	85-100	35-65	15-30
	36-49	Stratified very fine sand to silt loam to clay	ML, CL-ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	85-100	20-50	3-25
	49-80	Clay loam, loam	CL	A-6, A-7	0-5	0-5	95-100	90-100	80-100	65-85	30-50	10-30
Nahon-----	0-7	Silt loam	ML, CL	A-4, A-6, A-7	0	0	100	100	90-100	80-100	30-45	5-20
	7-9	Silty clay loam, silt loam	ML, CL	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-25
	9-21	Silty clay, silty clay loam	CH, CL, MH, ML	A-7	0	0	100	100	95-100	90-100	45-65	15-35
	21-43	Silty clay, silty clay loam, silt loam	CH, CL, MH, ML	A-6, A-7	0	0	100	100	90-100	80-100	30-65	10-30
	43-49	Stratified very fine sand to silty clay loam to clay	CL, ML, MH, CH	A-7	0	0	100	100	90-100	75-100	40-70	15-35
	49-80	Clay loam, loam	CL	A-6, A-7	0-5	0-5	95-100	90-100	80-100	65-85	30-50	10-30
Ew:												
Exline-----	0-2	Silt loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-45	10-20
	2-21	Clay, silty clay, silty clay loam	CH, MH	A-7	0	0	100	100	95-100	90-100	60-90	30-50
	21-40	Silty clay loam, silty clay, clay	CH, MH	A-7	0	0	100	100	95-100	85-100	50-80	20-45
	40-80	Stratified very fine sand to silty clay loam to clay	CL, CH	A-7	0	0	100	100	95-100	85-100	40-60	15-30

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Ew:(cont.)												
Heil-----	0-2	Silt loam	CL	A-6, A-7	0	0	100	100	90-100	70-100	25-45	10-25
	2-24	Silty clay, clay	CH	A-7	0	0	100	100	90-100	75-100	50-75	25-45
	24-80	Silty clay, silty clay loam, clay loam	CH, CL	A-6, A-7	0	0	100	100	85-100	60-100	25-75	11-45
Ex:												
Exline-----	0-2	Silt loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-45	10-20
	2-24	Clay, silty clay, silty clay loam	MH, CH	A-7	0	0	100	100	95-100	90-100	60-90	30-50
	24-39	Silty clay loam, silty clay, clay	CH, MH	A-7	0	0	100	100	95-100	85-100	50-80	20-45
	39-55	Stratified very fine sand to silty clay loam to clay	CH, CL	A-7	0	0	100	100	95-100	85-100	40-60	15-30
	55-80	Clay loam, loam	CL	A-6, A-7	0-5	0-5	95-100	90-100	80-100	65-85	30-50	10-30
Heil-----	0-2	Silt loam	CL	A-6, A-7	0	0	100	100	90-100	70-100	25-45	10-25
	2-24	Silty clay, clay	CH	A-7	0	0	100	100	90-100	75-100	50-75	25-45
	24-47	Silty clay, silty clay loam, clay loam	CL, CH	A-6, A-7	0	0	100	100	85-100	60-100	25-75	11-45
	47-80	Silty clay, silty clay loam, clay loam	CH, CL	A-6, A-7	0	0	100	100	85-100	60-100	25-75	11-45
EyA:												
Exline-----	0-2	Silt loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-45	10-20
	2-21	Clay, silty clay, silty clay loam	MH, CH	A-7	0	0	100	100	95-100	90-100	60-90	30-50
	21-40	Silty clay loam, silty clay, clay	MH, CH	A-7	0	0	100	100	95-100	85-100	50-80	20-45
	40-80	Stratified very fine sand to silty clay loam to clay	CL, CH	A-7	0	0	100	100	95-100	85-100	40-60	15-30
Putney-----	0-7	Silt loam	CL, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-45	5-20
	7-15	Silt loam, silty clay loam	ML, CL	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-25
	15-37	Stratified very fine sand to silt loam to clay	ML, CL	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-25
	37-80	Stratified very fine sandy loam to silty clay	CL-ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	85-100	25-50	5-25

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Fa:												
Farmsworth-----	0-8	Silt loam	ML, CL	A-4, A-6	0	0	100	100	90-100	70-95	25-40	3-15
	8-25	Clay, silty clay, silty clay loam	CL, CH	A-7	0	0	100	100	85-100	80-95	40-70	15-40
	25-43	Clay, silty clay, silty clay loam	CL, CH	A-7	0	0	95-100	95-100	85-100	80-95	40-65	15-35
	43-80	Silty clay loam	CL, SC	A-6, A-7	0	0	95-100	95-100	70-100	35-55	30-45	12-27
Durrstein-----												
	0-2	Silt loam	CL-ML, CL, ML	A-4, A-6	0	0	100	100	85-100	60-90	20-35	3-15
	2-14	Silty clay, clay, clay loam	MH, CH	A-7	0	0	95-100	95-100	85-100	65-95	50-85	20-50
	14-80	Silty clay, clay, silty clay loam	CH, CL	A-7	0	0	95-100	95-100	85-100	60-95	40-75	15-50
Fe:												
Ferney-----	0-3	Loam	CL	A-6	0	0	100	95-100	85-95	60-85	30-40	10-20
	3-16	Clay loam, clay	CL, MH, CH, ML	A-7	0	0-5	95-100	95-100	85-100	70-80	40-65	15-30
	16-80	Clay loam, clay	CL, CH	A-7	0	0-5	95-100	95-100	85-100	70-80	40-60	15-30
Heil-----												
	0-2	Silt loam	CL	A-6, A-7	0	0	100	100	90-100	70-100	25-45	10-25
	2-24	Silty clay, clay	CH	A-7	0	0	100	100	90-100	75-100	50-75	25-45
	24-80	Silty clay, silty clay loam, clay loam	CL, CH	A-6, A-7	0	0	100	100	85-100	60-100	25-75	11-45
Ff:												
Forestburg-----	0-7	Loamy sand	SC-SM, SM	A-2	0	0-5	95-100	90-100	70-100	15-35	15-25	NP-5
	7-36	Loamy sand, loamy fine sand	SC-SM, SM	A-2	0	0-5	95-100	90-100	70-100	15-35	15-25	NP-5
	36-53	Loam, clay loam	CL	A-4, A-6, A-7	0	0-5	95-100	95-100	80-95	60-90	30-45	8-20
	53-80	Stratified very fine sand to clay loam	SC-SM, SC, CL-ML, CL	A-2, A-4, A-6	0	0-5	95-100	90-100	60-90	25-75	20-40	5-15
Elsmere-----												
	0-19	Loamy sand	SM, SC-SM	A-2, A-4	0	0	100	90-100	50-75	15-45	15-25	NP-5
	19-46	Fine sand, loamy fine sand, loamy sand	SC-SM, SM	A-2, A-4	0	0	100	90-100	50-75	15-45	15-25	NP-5
	46-80	Clay loam, loam, fine sandy loam	CL, CL-ML, SC, SC-SM	A-4, A-6, A-7	0	0	100	90-100	60-100	45-90	25-45	5-20
Fh:												
Forestburg-----	0-7	Loamy sand	SM, SC-SM	A-2	0	0-5	95-100	90-100	70-100	15-35	15-25	NP-5
	7-36	Loamy sand, loamy fine sand	SM, SC-SM	A-2	0	0-5	95-100	90-100	70-100	15-35	15-25	NP-5
	36-53	Loam, clay loam	CL	A-4, A-6, A-7	0	0-5	95-100	95-100	80-95	60-90	30-45	8-20
	53-80	Stratified very fine sand to clay loam	CL, CL-ML, SC-SM, SC	A-2, A-4, A-6	0	0-5	95-100	90-100	60-90	25-75	20-40	5-15

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Fh: (cont.)												
Elsmere-----	0-19	Loamy sand	SC-SM, SM	A-2, A-4	0	0	100	90-100	50-75	15-45	15-25	NP-5
	19-46	Fine sand, loamy fine sand, loamy sand	SM, SC-SM	A-2, A-4	0	0	100	90-100	50-75	15-45	15-25	NP-5
	46-80	Clay loam, loam, fine sandy loam	CL-ML, SC, SC-SM, CL	A-4, A-6, A-7	0	0	100	90-100	60-100	45-90	25-45	5-20
Toko-----	0-8	Fine sandy loam	SM, SC-SM	A-4	0	0	100	100	60-85	35-50	15-30	NP-7
	8-11	Fine sandy loam, sandy loam, loamy sand	SM, SC-SM	A-2, A-4	0	0	100	95-100	55-85	25-45	15-30	NP-7
	11-28	Sandy clay loam, clay loam, sandy loam	SC, CL, SC- SM, CL-ML	A-4, A-6	0	0	100	95-100	70-100	40-70	20-45	5-20
	28-56	Sandy loam, loam, loamy sand	CL-ML, SC-SM, CL, SC	A-4	0	0	100	90-100	65-95	35-65	15-30	NP-10
	56-80	Clay loam, loam	ML, CL, CL-ML	A-4, A-6	0	0-5	95-100	95-100	80-100	55-75	20-40	3-20
FmA:												
Forman-----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0-5	95-100	90-100	85-100	60-90	20-40	5-15
	8-15	Clay loam	CL-ML, CL	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-80	25-45	5-20
	15-80	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-80	25-45	5-20
Aastad-----	0-14	Loam	ML, CL	A-6, A-7	0	0-5	95-100	95-100	80-95	50-75	35-45	10-20
	14-29	Clay loam	CL	A-7	0	0-5	95-100	90-100	75-95	50-75	40-50	15-25
	29-80	Clay loam, loam	CL	A-6, A-7	0	0-5	95-100	85-100	75-95	55-75	35-50	12-25
FmB:												
Forman-----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0-5	95-100	90-100	85-100	60-90	20-40	5-15
	8-15	Clay loam	CL-ML, CL	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-80	25-45	5-20
	15-80	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-80	25-45	5-20
Aastad-----	0-14	Loam	ML, CL	A-6, A-7	0	0-5	95-100	95-100	80-95	50-75	35-45	10-20
	14-29	Clay loam	CL	A-7	0	0-5	95-100	90-100	75-95	50-75	40-50	15-25
	29-80	Clay loam, loam	CL	A-6, A-7	0	0-5	95-100	85-100	75-95	55-75	35-50	12-25
FnC:												
Forman-----	0-8	Loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	90-100	85-100	60-90	20-40	5-15
	8-15	Clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-80	25-45	5-20
	15-80	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-80	25-45	5-20
Buse-----	0-7	Loam	ML, CL-ML, CL	A-4, A-6	0	0	90-100	85-95	70-95	55-90	20-35	3-15
	7-35	Loam, clay loam	CL, ML, CL-ML	A-4, A-6, A-7	0	0	90-100	85-100	70-90	55-85	25-45	5-20
	35-80	Loam, clay loam	CL, ML, CL-ML	A-4, A-6, A-7	0	0	90-100	85-100	70-90	55-85	25-45	5-20

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
FrB:												
Forman-----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0-5	95-100	90-100	85-100	60-90	20-40	5-15
	8-15	Clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-80	25-45	5-20
	15-80	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-80	25-45	5-20
Buse-----	0-7	Loam	CL-ML, ML, CL	A-4, A-6	0	0	90-100	85-95	70-95	55-90	20-35	3-15
	7-35	Loam, clay loam	CL-ML, ML, CL	A-4, A-6, A-7	0	0	90-100	85-100	70-90	55-85	25-45	5-20
	35-80	Loam, clay loam	CL-ML, ML, CL	A-4, A-6, A-7	0	0	90-100	85-100	70-90	55-85	25-45	5-20
Aastad-----	0-14	Loam	ML, CL	A-6, A-7	0	0-5	95-100	95-100	80-95	50-75	35-45	10-20
	14-29	Clay loam	CL	A-7	0	0-5	95-100	90-100	75-95	50-75	40-50	15-25
	29-80	Clay loam, loam	CL	A-6, A-7	0	0-5	95-100	85-100	75-95	55-75	35-50	12-25
FrC:												
Forman-----	0-8	Loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	90-100	85-100	60-90	20-40	5-15
	8-15	Clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-80	25-45	5-20
	15-80	Loam, clay loam	CL-ML, CL	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-80	25-45	5-20
Buse-----	0-7	Loam	CL, CL-ML, ML	A-4, A-6	0	0	90-100	85-95	70-95	55-90	20-35	3-15
	7-35	Loam, clay loam	CL, CL-ML, ML	A-4, A-6, A-7	0	0	90-100	85-100	70-90	55-85	25-45	5-20
	35-80	Loam, clay loam	CL-ML, ML, CL	A-4, A-6, A-7	0	0	90-100	85-100	70-90	55-85	25-45	5-20
Aastad-----	0-14	Loam	CL, ML	A-6, A-7	0	0-5	95-100	95-100	80-95	50-75	35-45	10-20
	14-29	Clay loam	CL	A-7	0	0-5	95-100	90-100	75-95	50-75	40-50	15-25
	29-80	Clay loam, loam	CL	A-6, A-7	0	0-5	95-100	85-100	75-95	55-75	35-50	12-25
FsA:												
Forman-----	0-8	Loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	90-100	85-100	60-90	20-40	5-15
	8-15	Clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-80	25-45	5-20
	15-80	Loam, clay loam	CL-ML, CL	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-80	25-45	5-20
Cresbard-----	0-8	Loam	CL	A-6	0	0	100	90-100	85-100	60-80	30-40	10-20
	8-11	Clay loam, silty clay loam	ML, CL	A-6, A-7	0	0	100	90-100	90-100	70-85	35-50	10-25
	11-22	Clay loam, silty clay, clay	CH, CL	A-6, A-7	0	0	95-100	90-100	85-100	65-85	30-60	15-30
	22-38	Clay loam, silty clay, clay	CL, CH	A-7	0	0	95-100	90-100	85-100	65-85	40-60	15-30
	38-80	Clay loam, loam, silt loam	CH, CL, MH, ML	A-6, A-7	0	0-5	95-100	90-100	85-100	50-95	25-55	10-25

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
FsB:												
Forman-----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0-5	95-100	90-100	85-100	60-90	20-40	5-15
	8-15	Clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-80	25-45	5-20
	15-80	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-80	25-45	5-20
Cresbard-----	0-8	Loam	CL	A-6	0	0	100	90-100	85-100	60-80	30-40	10-20
	8-11	Clay loam, silty clay loam	CL, ML	A-6, A-7	0	0	100	90-100	90-100	70-85	35-50	10-25
	11-22	Clay loam, silty clay, clay	CH, CL	A-6, A-7	0	0	95-100	90-100	85-100	65-85	30-60	15-30
	22-38	Clay loam, silty clay, clay	CL, CH	A-7	0	0	95-100	90-100	85-100	65-85	40-60	15-30
	38-80	Clay loam, loam, silt loam	CH, CL, MH, ML	A-6, A-7	0	0-5	95-100	90-100	85-100	50-95	25-55	10-25
FtA:												
Forman-----	0-8	Loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	90-100	85-100	60-90	20-40	5-15
	8-15	Clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-80	25-45	5-20
	15-80	Loam, clay loam	CL-ML, CL	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-80	25-45	5-20
Cresbard-----	0-8	Loam	CL	A-6	0	0	100	90-100	85-100	60-80	30-40	10-20
	8-11	Clay loam, silty clay loam	CL, ML	A-6, A-7	0	0	100	90-100	90-100	70-85	35-50	10-25
	11-22	Clay loam, silty clay, clay	CH, CL	A-6, A-7	0	0	95-100	90-100	85-100	65-85	30-60	15-30
	22-38	Clay loam, silty clay, clay	CL, CH	A-7	0	0	95-100	90-100	85-100	65-85	40-60	15-30
	38-80	Clay loam, loam, silt loam	CH, CL, MH, ML	A-6, A-7	0	0-5	95-100	90-100	85-100	50-95	25-55	10-25
Tonka-----	0-16	Silt loam	CL, CL-ML	A-4, A-6	0-1	0-2	100	95-100	90-100	70-90	35-45	15-25
	16-41	Silty clay loam, clay loam, silty clay	CH, CL	A-6, A-7	0-1	0-2	100	95-100	90-100	75-95	50-60	30-40
	41-80	Silty clay loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0-1	0-3	90-100	85-100	60-100	50-90	35-55	15-30
Ga:												
Gardena-----	0-20	Very fine sandy loam	ML, CL-ML, CL	A-4, A-6	0	0	100	100	85-100	55-70	15-30	NP-15
	20-80	Very fine sandy loam, loamy very fine sand	SM, CL-ML, ML	A-2-4, A-4, A-6	0	0	100	100	75-100	40-100	10-40	NP-15
Gd:												
Gardena-----	0-20	Silt loam	CL, ML	A-4, A-6	0	0	100	100	90-100	70-100	25-40	NP-15
	20-80	Very fine sandy loam, loamy very fine sand	CL-ML, SM, ML	A-4, A-6, A- 2-4	0	0	100	100	75-100	40-100	10-40	NP-15

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Gd: (cont.)												
Glyndon-----	0-12	Silt loam	ML	A-4	0	0	100	100	95-100	70-95	20-40	NP-10
	12-46	Silt loam, very fine sandy loam, loam	ML, CL, CL-ML	A-4	0	0	100	100	90-100	85-95	20-30	NP-10
	46-80	Loamy very fine sand, silt loam, very fine sandy loam	CL, ML, SC, SM	A-4	0	0	100	100	85-100	35-75	10-30	NP-10
Ge:												
Gardena-----	0-20	Very fine sandy loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	85-100	55-70	15-30	NP-15
	20-80	Very fine sandy loam, loamy very fine sand	SM, CL-ML, ML	A-2-4, A-4, A-6	0	0	100	100	75-100	40-100	10-40	NP-15
Turton-----	0-8	Very fine sandy loam	CL-ML, SC-SM, SM, ML	A-4	0	0	100	100	95-100	45-65	15-30	NP-7
	8-10	Very fine sandy loam, fine sandy loam, loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	100	90-100	40-70	15-30	NP-7
	10-24	Loam, clay loam, silty clay loam	CL, ML	A-4, A-6	0	0	100	100	90-100	65-85	30-40	6-15
	24-38	Loam, silt loam, fine sandy loam	CL-ML, SC, SC-SM, CL	A-4, A-6	0	0	100	100	90-100	45-80	20-35	5-15
	38-80	Very fine sandy loam, loam, silt loam	CL-ML, SC, SC-SM, CL	A-4, A-6	0	0	100	100	90-100	45-85	15-35	5-15
GgA:												
Great Bend-----	0-7	Silt loam	ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-45	5-20
	7-12	Silt loam, silty clay loam	ML, CL	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	12-32	Silt loam, silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	32-53	Stratified silt loam to silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	53-80	Stratified very fine sand to silt loam to clay	ML, CL-ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	85-100	25-50	3-25

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	<i>In</i>				<i>Pct</i>	<i>Pct</i>					<i>Pct</i>	
GnA:												
Great Bend-----	0-7	Silt loam	ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-45	5-20
	7-12	Silt loam, silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	12-32	Silt loam, silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	32-53	Stratified silt loam to silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	53-80	Stratified very fine sand to silt loam to clay	ML, CL, CL-ML	A-4, A-6, A-7	0	0	100	100	95-100	85-100	25-50	3-25
Beotia-----	0-9	Silt loam	ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-45	5-20
	9-21	Silt loam, silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	90-100	32-50	10-20
	21-39	Silt loam, silty clay loam	CL, CL-ML, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	25-50	5-20
	39-80	Stratified very fine sand to silt loam to clay	ML, CL, CL-ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	25-50	5-20
GnB:												
Great Bend-----	0-7	Silt loam	ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-45	5-20
	7-12	Silt loam, silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	12-32	Silt loam, silty clay loam	ML, CL	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	32-53	Stratified silt loam to silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	53-80	Stratified very fine sand to silt loam to clay	CL-ML, ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	85-100	25-50	3-25
Beotia-----	0-9	Silt loam	CL, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-45	5-20
	9-21	Silt loam, silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	90-100	32-50	10-20
	21-39	Silt loam, silty clay loam	CL, CL-ML, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	25-50	5-20
	39-80	Stratified very fine sand to silt loam to clay	CL, CL-ML, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	25-50	5-20

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
GoA:												
Great Bend-----	0-7	Silt loam	CL, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-45	5-20
	7-14	Silt loam, silty clay loam	ML, CL	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	14-29	Silt loam, silty clay loam	ML, CL	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	29-49	Stratified silt loam to silty clay loam	CL, CL-ML	A-4, A-6, A-7	0	0	100	100	95-100	85-100	25-50	5-25
	49-80	Clay loam, loam	CL	A-6, A-7	0-5	0-5	95-100	90-100	80-100	65-85	30-50	10-30
Beotia-----	0-12	Silt loam	ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-45	5-20
	12-27	Silt loam, silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	90-100	30-50	10-20
	27-46	Silt loam, silty clay loam	ML, CL-ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	90-100	25-50	5-20
	46-52	Stratified very fine sand to silt loam to clay	ML, CL, CL-ML	A-4, A-6, A-7	0	0	100	100	95-100	85-100	25-50	5-20
	52-80	Clay loam, loam	CL	A-6, A-7	0-5	0-5	95-100	90-100	80-100	65-85	30-50	10-30
GpA:												
Great Bend-----	0-7	Silt loam	ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-45	5-20
	7-12	Silt loam, silty clay loam	ML, CL	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	12-32	Silt loam, silty clay loam	ML, CL	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	32-53	Stratified silt loam to silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	53-80	Stratified very fine sand to silt loam to clay	CL, CL-ML, ML	A-4, A-6, A-7	0	0	100	100	95-100	85-100	25-50	3-25
Putney-----	0-7	Silt loam	CL, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-45	5-20
	7-15	Silt loam, silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-25
	15-37	Stratified very fine sand to silt loam to clay	CL, ML	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-25
	37-80	Stratified very fine sandy loam to silty clay	CL, CL-ML	A-4, A-6, A-7	0	0	100	100	95-100	85-100	25-50	5-25

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
GpB:												
Great Bend-----	0-7	Silt loam	ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-45	5-20
	7-12	Silt loam, silty clay loam	ML, CL	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	12-32	Silt loam, silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	32-53	Stratified silt loam to silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	53-80	Stratified very fine sand to silt loam to clay	ML, CL-ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	85-100	25-50	3-25
Putney-----	0-7	Silt loam	ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-45	5-20
	7-15	Silt loam, silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-25
	15-37	Stratified very fine sand to silt loam to clay	CL, ML	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-25
	37-80	Stratified very fine sandy loam to silty clay	CL, CL-ML	A-4, A-6, A-7	0	0	100	100	95-100	85-100	25-50	5-25
GtB:												
Great Bend-----	0-7	Silt loam	CL, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-45	5-20
	7-12	Silt loam, silty clay loam	ML, CL	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	12-32	Silt loam, silty clay loam	ML, CL	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	32-53	Stratified silt loam to silty clay loam	ML, CL	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	53-80	Stratified very fine sand to silt loam to clay	CL-ML, CL, ML	A-4, A-6, A-7	0	0	100	100	95-100	85-100	25-50	3-25
Zell-----	0-7	Silt loam	ML, CL	A-4, A-6	0	0	100	95-100	90-100	80-100	30-40	5-15
	7-31	Silt loam, very fine sandy loam, loam	CL-ML, CL	A-4, A-6	0	0	100	95-100	85-100	70-100	25-40	5-15
	31-80	Silt loam, very fine sandy loam, loam	ML, CL-ML	A-4	0	0	100	95-100	85-100	60-100	15-25	NP-7

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
GtC:												
Great Bend-----	0-7	Silt loam	ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-45	5-20
	7-12	Silt loam, silty clay loam	ML, CL	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	12-32	Silt loam, silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	32-53	Stratified silt loam to silty clay loam	ML, CL	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	53-80	Stratified very fine sand to silt loam to clay	ML, CL-ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	85-100	25-50	3-25
Zell-----	0-7	Silt loam	CL, ML	A-4, A-6	0	0	100	95-100	90-100	80-100	30-40	5-15
	7-31	Silt loam, very fine sandy loam, loam	CL, CL-ML	A-4, A-6	0	0	100	95-100	85-100	70-100	25-40	5-15
	31-80	Silt loam, very fine sandy loam, loam	CL-ML, ML	A-4	0	0	100	95-100	85-100	60-100	15-25	NP-7
GzC:												
Great Bend-----	0-7	Silt loam	ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-45	5-20
	7-12	Silt loam, silty clay loam	ML, CL	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	12-32	Silt loam, silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	32-53	Stratified silt loam to silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	53-80	Stratified very fine sand to silt loam to clay	CL, CL-ML, ML	A-4, A-6, A-7	0	0	100	100	95-100	85-100	25-50	3-25
Zell-----	0-7	Silt loam	CL, ML	A-4, A-6	0	0	100	95-100	90-100	80-100	30-40	5-15
	7-31	Silt loam, very fine sandy loam, loam	CL, CL-ML	A-4, A-6	0	0	100	95-100	85-100	70-100	25-40	5-15
	31-80	Silt loam, very fine sandy loam, loam	CL-ML, ML	A-4	0	0	100	95-100	85-100	60-100	15-25	NP-7
Huffton-----	0-7	Silt loam	ML, CL	A-4, A-6	0	0	100	100	85-100	80-100	30-40	5-15
	7-28	Silt loam, loam, very fine sandy loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	80-100	25-40	5-15
	28-80	Silt loam, loam, very fine sandy loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	80-100	25-40	5-15

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
HaA:												
Hamerly-----	0-9	Loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	90-100	80-95	60-90	20-40	5-20
	9-29	Loam, clay loam	CL-ML, CL	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-75	20-45	5-25
	29-80	Loam, clay loam	CL-ML, CL	A-4, A-6, A-7	0	0-5	95-100	90-100	75-95	55-75	20-45	5-25
Hb:												
Hamerly-----	0-9	Loam	CL-ML, CL	A-4, A-6	0	0-5	95-100	90-100	80-95	60-90	20-40	5-20
	9-29	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-75	20-45	5-25
	29-80	Loam, clay loam	CL-ML, CL	A-4, A-6, A-7	0	0-5	95-100	90-100	75-95	55-75	20-45	5-25
Tonka-----	0-16	Silt loam	CL-ML, CL	A-4, A-6	0-1	0-2	100	95-100	90-100	70-90	35-45	15-25
	16-41	Silty clay loam, clay loam, silty clay	CL, CH	A-6, A-7	0-1	0-2	100	95-100	90-100	75-95	50-60	30-40
	41-80	Silty clay loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0-1	0-3	90-100	85-100	60-100	50-90	35-55	15-30
HcA:												
Hand-----	0-7	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	85-100	75-100	50-85	25-40	5-20
	7-18	Loam, silt loam	CL-ML, CL	A-4, A-6	0	0	95-100	85-100	75-100	50-85	25-40	5-20
	18-35	Loam, clay loam, silt loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	80-100	75-100	50-80	25-40	5-20
	35-80	Stratified fine sandy loam to silt loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	80-100	70-100	50-80	25-40	5-15
Bonilla-----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0	100	95-100	75-100	50-80	25-40	5-20
	8-27	Loam, clay loam	CL	A-6, A-7	0	0	100	95-100	85-100	60-90	30-50	10-25
	27-47	Loam, clay loam, silt loam	CL	A-6, A-7	0	0-5	95-100	95-100	85-100	60-90	30-45	10-22
	47-80	Loam, clay loam, silt loam	CL	A-6, A-7	0	0-5	95-100	95-100	85-100	60-90	30-45	10-22
HcB:												
Hand-----	0-7	Loam	CL-ML, CL	A-4, A-6	0	0	95-100	85-100	75-100	50-85	25-40	5-20
	7-18	Loam, silt loam	CL-ML, CL	A-4, A-6	0	0	95-100	85-100	75-100	50-85	25-40	5-20
	18-35	Loam, clay loam, silt loam	CL-ML, CL	A-4, A-6	0	0-5	95-100	80-100	75-100	50-80	25-40	5-20
	35-80	Stratified fine sandy loam to silt loam	CL-ML, CL	A-4, A-6	0	0-5	95-100	80-100	70-100	50-80	25-40	5-15
Bonilla-----	0-8	Loam	CL, CL-ML	A-4, A-6	0	0	100	95-100	75-100	50-80	25-40	5-20
	8-27	Loam, clay loam	CL	A-6, A-7	0	0	100	95-100	85-100	60-90	30-50	10-25
	27-47	Loam, clay loam, silt loam	CL	A-6, A-7	0	0-5	95-100	95-100	85-100	60-90	30-45	10-22
	47-80	Loam, clay loam, silt loam	CL	A-6, A-7	0	0-5	95-100	95-100	85-100	60-90	30-45	10-22

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
HdA: Hand-----	0-7	Fine sandy loam	SM, SC, ML, CL	A-2, A-4	0	0-5	95-100	90-100	60-100	25-55	20-30	NP-10
	7-18	Loam, silt loam	CL-ML, CL	A-4, A-6	0	0	95-100	85-100	75-100	50-85	25-40	5-20
	18-35	Loam, clay loam, silt loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	80-100	75-100	50-80	25-40	5-20
	35-80	Stratified fine sandy loam to silt loam	CL-ML, CL	A-4, A-6	0	0-5	95-100	80-100	70-100	50-80	25-40	5-15
Carthage-----	0-7	Fine sandy loam	SM, CL, ML, SC	A-2, A-4	0	0-5	95-100	90-100	60-100	25-55	20-30	NP-10
	7-24	Fine sandy loam, sandy loam	ML, SC, SC- SM, SM	A-2, A-4	0	0-5	95-100	90-100	50-100	15-55	15-25	NP-10
	24-80	Loam, clay loam	CL	A-4, A-6, A-7	0	0-5	95-100	95-100	80-95	55-80	30-45	8-20
He: Hand-----	0-7	Fine sandy loam	SC, CL, ML, SM	A-2, A-4	0	0-5	95-100	90-100	60-100	25-55	20-30	NP-10
	7-18	Loam, silt loam	CL, CL-ML	A-4, A-6	0	0	95-100	85-100	75-100	50-85	25-40	5-20
	18-35	Loam, clay loam, silt loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	80-100	75-100	50-80	25-40	5-20
	35-80	Stratified fine sandy loam to silt loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	80-100	70-100	50-80	25-40	5-15
Carthage-----	0-7	Fine sandy loam	SM, SC, CL, ML	A-2, A-4	0	0-5	95-100	90-100	60-100	25-55	20-30	NP-10
	7-24	Fine sandy loam, sandy loam	SC-SM, ML, SC, SM	A-2, A-4	0	0-5	95-100	90-100	50-100	15-55	15-25	NP-10
	24-80	Loam, clay loam	CL	A-4, A-6, A-7	0	0-5	95-100	95-100	80-95	55-80	30-45	8-20
Overshue-----	0-7	Fine sandy loam	ML, SM, CL- ML, CL	A-2-4, A-4	0	0	100	100	60-85	30-55	0-30	NP-10
	7-42	Fine sandy loam, loamy fine sand, sandy loam	SM, ML, CL-ML	A-2, A-2-4, A-4	0	0	100	100	50-95	20-55	0-20	NP-10
	42-80	Loam, clay loam	ML, CL	A-4, A-6, A-7	0	0	95-100	95-100	85-95	50-85	30-45	5-20
HfC: Hand-----	0-7	Loam	CL-ML, CL	A-4, A-6	0	0	95-100	85-100	75-100	50-85	25-40	5-20
	7-18	Loam, silt loam	CL-ML, CL	A-4, A-6	0	0	95-100	85-100	75-100	50-85	25-40	5-20
	18-35	Loam, clay loam, silt loam	CL-ML, CL	A-4, A-6	0	0-5	95-100	80-100	75-100	50-80	25-40	5-20
	35-80	Stratified fine sandy loam to silt loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	80-100	70-100	50-80	25-40	5-15

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
HfC: (cont.)												
Ethan-----	0-8	Loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	90-100	85-100	55-85	25-40	5-20
	8-20	Loam, clay loam	CL	A-6, A-7	0-3	0-5	95-100	90-100	80-100	55-80	30-50	10-25
	20-32	Loam, clay loam	CL	A-4, A-6, A-7	0-3	0-5	90-100	85-100	75-100	50-95	28-45	8-20
	32-60	Loam, clay loam	CL	A-4, A-6, A-7	0-3	0-5	90-100	85-100	75-100	50-95	28-45	8-20
HgB:												
Hand-----	0-7	Loam	CL-ML, CL	A-4, A-6	0	0	95-100	85-100	75-100	50-85	25-40	5-20
	7-18	Loam, silt loam	CL, CL-ML	A-4, A-6	0	0	95-100	85-100	75-100	50-85	25-40	5-20
	18-35	Loam, clay loam, silt loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	80-100	75-100	50-80	25-40	5-20
	35-80	Stratified fine sandy loam to silt loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	80-100	70-100	50-80	25-40	5-15
Ethan-----	0-8	Loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	90-100	85-100	55-85	25-40	5-20
	8-20	Loam, clay loam	CL	A-6, A-7	0-3	0-5	95-100	90-100	80-100	55-80	30-50	10-25
	20-32	Loam, clay loam	CL	A-4, A-6, A-7	0-3	0-5	90-100	85-100	75-100	50-95	28-45	8-20
	32-60	Loam, clay loam	CL	A-4, A-6, A-7	0-3	0-5	90-100	85-100	75-100	50-95	28-45	8-20
Bonilla-----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0	100	95-100	75-100	50-80	25-40	5-20
	8-27	Loam, clay loam	CL	A-6, A-7	0	0	100	95-100	85-100	60-90	30-50	10-25
	27-47	Loam, clay loam, silt loam	CL	A-6, A-7	0	0-5	95-100	95-100	85-100	60-90	30-45	10-22
	47-80	Loam, clay loam, silt loam	CL	A-6, A-7	0	0-5	95-100	95-100	85-100	60-90	30-45	10-22
HgC:												
Hand-----	0-7	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	85-100	75-100	50-85	25-40	5-20
	7-18	Loam, silt loam	CL, CL-ML	A-4, A-6	0	0	95-100	85-100	75-100	50-85	25-40	5-20
	18-35	Loam, clay loam, silt loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	80-100	75-100	50-80	25-40	5-20
	35-80	Stratified fine sandy loam to silt loam	CL-ML, CL	A-4, A-6	0	0-5	95-100	80-100	70-100	50-80	25-40	5-15
Ethan-----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0-5	95-100	90-100	85-100	55-85	25-40	5-20
	8-20	Loam, clay loam	CL	A-6, A-7	0-3	0-5	95-100	90-100	80-100	55-80	30-50	10-25
	20-32	Loam, clay loam	CL	A-4, A-6, A-7	0-3	0-5	90-100	85-100	75-100	50-95	28-45	8-20
	32-60	Loam, clay loam	CL	A-4, A-6, A-7	0-3	0-5	90-100	85-100	75-100	50-95	28-45	8-20
Bonilla-----	0-8	Loam	CL, CL-ML	A-4, A-6	0	0	100	95-100	75-100	50-80	25-40	5-20
	8-27	Loam, clay loam	CL	A-6, A-7	0	0	100	95-100	85-100	60-90	30-50	10-25
	27-47	Loam, clay loam, silt loam	CL	A-6, A-7	0	0-5	95-100	95-100	85-100	60-90	30-45	10-22
	47-80	Loam, clay loam, silt loam	CL	A-6, A-7	0	0-5	95-100	95-100	85-100	60-90	30-45	10-22

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
HhB: Hand-----	0-7	Fine sandy loam	SM, CL, ML, SC	A-2, A-4	0	0-5	95-100	90-100	60-100	25-55	20-30	NP-10
	7-18	Loam, silt loam	CL, CL-ML	A-4, A-6	0	0	95-100	85-100	75-100	50-85	25-40	5-20
	18-35	Loam, clay loam, silt loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	80-100	75-100	50-80	25-40	5-20
	35-80	Stratified fine sandy loam to silt loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	80-100	70-100	50-80	25-40	5-15
Ethan-----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0-5	95-100	90-100	85-100	55-85	25-40	5-20
	8-20	Loam, clay loam	CL	A-6, A-7	0-3	0-5	95-100	90-100	80-100	55-80	30-50	10-25
	20-32	Loam, clay loam	CL	A-4, A-6, A-7	0-3	0-5	90-100	85-100	75-100	50-95	28-45	8-20
	32-60	Loam, clay loam	CL	A-4, A-6, A-7	0-3	0-5	90-100	85-100	75-100	50-95	28-45	8-20
Carthage-----	0-7	Fine sandy loam	ML, SM, SC, CL	A-2, A-4	0	0-5	95-100	90-100	60-100	25-55	20-30	NP-10
	7-24	Fine sandy loam, sandy loam	SC, SC-SM, SM, ML	A-2, A-4	0	0-5	95-100	90-100	50-100	15-55	15-25	NP-10
	24-80	Loam, clay loam	CL	A-4, A-6, A-7	0	0-5	95-100	95-100	80-95	55-80	30-45	8-20
HjB: Hand-----	0-7	Loam	CL-ML, CL	A-4, A-6	0	0	95-100	85-100	75-100	50-85	25-40	5-20
	7-18	Loam, silt loam	CL-ML, CL	A-4, A-6	0	0	95-100	85-100	75-100	50-85	25-40	5-20
	18-35	Loam, clay loam, silt loam	CL-ML, CL	A-6, A-4	0	0-5	95-100	80-100	75-100	50-80	25-40	5-20
	35-80	Stratified fine sandy loam to silt loam	CL-ML, CL	A-4, A-6	0	0-5	95-100	80-100	70-100	50-80	25-40	5-15
Talmo-----	0-7	Gravelly loam	SC, CL	A-4, A-6	0	0-5	90-100	65-90	35-90	25-80	28-34	9-14
	7-80	Extremely gravelly sand, very gravelly sand, very gravelly loamy sand	SM, GW, GM, SW	A-1, A-2	0	0-10	40-95	20-65	15-35	0-35	15-25	NP-5
HjC: Hand-----	0-7	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	85-100	75-100	50-85	25-40	5-20
	7-18	Loam, silt loam	CL, CL-ML	A-4, A-6	0	0	95-100	85-100	75-100	50-85	25-40	5-20
	18-35	Loam, clay loam, silt loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	80-100	75-100	50-80	25-40	5-20
	35-80	Stratified fine sandy loam to silt loam	CL-ML, CL	A-4, A-6	0	0-5	95-100	80-100	70-100	50-80	25-40	5-15

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
HjC: (cont.)												
Talmo-----	0-7	Gravelly loam	CL, SC	A-4, A-6	0	0-5	90-100	65-90	35-90	25-80	28-34	9-14
	7-80	Extremely gravelly sand, very gravelly sand, very gravelly loamy sand	GW, GM, SM, SW	A-1, A-2	0	0-10	40-95	20-65	15-35	0-35	15-25	NP-5
Hk:												
Harmony-----	0-8	Silt loam	ML	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-20
	8-34	Silty clay, silty clay loam	ML, MH, CH, CL	A-7	0	0	100	100	95-100	90-100	40-65	15-32
	34-50	Stratified very fine sand to silt loam to clay	CL, CL-ML, ML	A-4, A-6, A-7	0	0	100	100	95-100	85-100	25-50	5-20
	50-80	Clay loam, loam	CL	A-6, A-7	0-5	0-5	95-100	90-100	80-100	65-85	30-50	10-30
Aberdeen-----	0-11	Silt loam	ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-45	7-20
	11-23	Silty clay, clay, silty clay loam	MH, ML	A-7	0	0	100	100	95-100	90-100	45-75	15-40
	23-36	Silty clay loam, silty clay	CL, MH, ML, CH	A-6, A-7	0	0	100	100	95-100	85-100	35-65	15-30
	36-49	Stratified very fine sand to silt loam to clay	ML, CL, CL-ML	A-4, A-6, A-7	0	0	100	100	95-100	85-100	20-50	3-25
	49-80	Clay loam, loam	CL	A-6, A-7	0-5	0-5	95-100	90-100	80-100	65-85	30-50	10-30
Hm:												
Harmony-----	0-11	Silty clay loam	ML, CL	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-25
	11-25	Silty clay, silty clay loam	MH, CL, CH, ML	A-7	0	0	100	100	95-100	90-100	40-65	15-32
	25-80	Stratified very fine sand to silt loam to clay	CL, CL-ML, ML	A-4, A-6, A-7	0	0	100	100	95-100	85-100	25-50	5-20
Aberdeen-----	0-13	Silty clay loam	ML, CL	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-25
	13-23	Silty clay, clay, silty clay loam	MH, ML	A-7	0	0	100	100	95-100	90-100	45-75	15-40
	23-39	Silty clay loam, silty clay	CH, ML, MH, CL	A-6, A-7	0	0	100	100	95-100	85-100	35-65	15-30
	39-80	Stratified very fine sand to silt loam to clay	CL, ML, CL- ML, CH	A-4, A-6, A-7	0	0	100	100	95-100	85-100	20-56	3-33

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Hn: Harmony-----	0-11	Silt loam	ML	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-20
	11-25	Silty clay, silty clay loam	CH, CL, MH, ML	A-7	0	0	100	100	95-100	90-100	40-65	15-32
	25-80	Stratified very fine sand to silt loam to clay	CL-ML, CL, ML	A-6, A-7, A-4	0	0	100	100	95-100	85-100	25-50	5-20
Beotia-----	0-9	Silt loam	CL, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-45	5-20
	9-21	Silt loam, silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	90-100	32-50	10-20
	21-39	Silt loam, silty clay loam	ML, CL-ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	90-100	25-50	5-20
	39-80	Stratified very fine sand to silt loam to clay	CL, CL-ML, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	25-50	5-20
Ho: Harmony-----	0-8	Silt loam	ML	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-20
	8-34	Silty clay, silty clay loam	CH, MH, ML, CL	A-7	0	0	100	100	95-100	90-100	40-65	15-32
	34-50	Stratified very fine sand to silt loam to clay	ML, CL-ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	85-100	25-50	5-20
	50-80	Clay loam, loam	CL	A-6, A-7	0-5	0-5	95-100	90-100	80-100	65-85	30-50	10-30
Beotia-----	0-12	Silt loam	ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-45	5-20
	12-27	Silt loam, silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	90-100	30-50	10-20
	27-46	Silt loam, silty clay loam	ML, CL, CL-ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	25-50	5-20
	46-52	Stratified very fine sand to silt loam to clay	CL-ML, CL, ML	A-4, A-6, A-7	0	0	100	100	95-100	85-100	25-50	5-20
	52-80	Clay loam, loam	CL	A-6, A-7	0-5	0-5	95-100	90-100	80-100	65-85	30-50	10-30
Hp: Harriet-----	0-2	Loam	CL-ML, CL	A-4, A-6	0	0	100	100	85-95	60-80	25-45	5-20
	2-17	Clay loam, silty clay loam, silty clay	CH, CL	A-6, A-7	0	0	100	100	90-100	70-100	35-70	20-40
	17-42	Loam, silty clay loam, clay loam	CL, CH	A-6	0	0	100	100	90-100	60-100	25-55	10-30
	42-80	Stratified sandy loam to silty clay	CH, CL, CL-ML	A-4, A-6, A-7	0	0	100	100	90-100	60-100	20-65	5-40

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Hr:												
Heil-----	0-2	Silt loam	CL	A-6, A-7	0	0	100	100	90-100	70-100	25-45	10-25
	2-24	Silty clay, clay	CH	A-7	0	0	100	100	90-100	75-100	50-75	25-45
	24-80	Silty clay, silty clay loam, clay loam	CH, CL	A-6, A-7	0	0	100	100	85-100	60-100	25-75	11-45
HsA:												
Henkin-----	0-7	Fine sandy loam	CL, ML, SC, SM	A-4	0	0-5	90-100	80-100	65-100	35-55	15-30	NP-10
	7-35	Loam, sandy loam, fine sandy loam	ML, SC, CL, SM	A-4	0	0-5	90-100	80-100	65-100	35-60	15-30	NP-10
	35-46	Sandy loam, fine sandy loam, loam	CL, ML, SC, SM	A-2, A-4	0	0-5	90-100	80-100	65-90	30-60	15-30	NP-10
	46-80	Stratified fine sand to sandy loam to clay loam	SC-SM, SC, SM, SP-SM	A-1, A-2, A- 3, A-4	0	0-5	90-100	80-100	35-95	5-50	15-35	NP-10
Blendon-----	0-9	Fine sandy loam	SM	A-4	0	0	100	90-100	60-100	35-50	20-30	NP-5
	9-36	Fine sandy loam, sandy loam, loam	CL, SM, SC, ML	A-2, A-4	0	0	100	85-100	60-100	20-60	20-33	NP-10
	36-48	Fine sandy loam, sandy loam, loamy sand	SM	A-2, A-4	0	0	100	85-100	60-100	20-45	20-30	NP-5
	48-80	Fine sandy loam, loamy fine sand, loamy sand	SP-SM, SM, SC, SC-SM	A-2, A-4	0	0	85-100	75-100	50-100	10-45	15-30	NP-10
HsB:												
Henkin-----	0-7	Fine sandy loam	SM, SC, ML, CL	A-4	0	0-5	90-100	80-100	65-100	35-55	15-30	NP-10
	7-35	Loam, sandy loam, fine sandy loam	SM, SC, CL, ML	A-4	0	0-5	90-100	80-100	65-100	35-60	15-30	NP-10
	35-46	Sandy loam, fine sandy loam, loam	SM, SC, CL, ML	A-2, A-4	0	0-5	90-100	80-100	65-90	30-60	15-30	NP-10
	46-80	Stratified fine sand to sandy loam to clay loam	SP-SM, SM, SC-SM, SC	A-1, A-2, A- 3, A-4	0	0-5	90-100	80-100	35-95	5-50	15-35	NP-10
Blendon-----	0-9	Fine sandy loam	SM	A-4	0	0	100	90-100	60-100	35-50	20-30	NP-5
	9-36	Fine sandy loam, sandy loam, loam	SM, SC, ML, CL	A-2, A-4	0	0	100	85-100	60-100	20-60	20-33	NP-10
	36-48	Fine sandy loam, sandy loam, loamy sand	SM	A-2, A-4	0	0	100	85-100	60-100	20-45	20-30	NP-5
	48-80	Fine sandy loam, loamy fine sand, loamy sand	SP-SM, SC, SC-SM, SM	A-2, A-4	0	0	85-100	75-100	50-100	10-45	15-30	NP-10

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
HtB:												
Houdek-----	0-6	Loam	CL	A-4, A-6, A-7	0	0-5	95-100	95-100	85-100	70-85	30-45	8-20
	6-19	Clay loam	CL, ML	A-6, A-7	0	0-5	95-100	95-100	85-100	60-80	35-50	10-25
	19-42	Clay loam, loam	CL, ML	A-6, A-7	0-1	0-10	95-100	95-100	85-100	60-80	35-50	10-25
	42-80	Clay loam, loam	CL	A-6, A-7	0	0-5	90-100	90-100	80-100	55-80	30-50	10-25
Ethan-----	0-8	Loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	90-100	85-100	55-85	25-40	5-20
	8-20	Loam, clay loam	CL	A-6, A-7	0-3	0-5	95-100	90-100	80-100	55-80	30-50	10-25
	20-32	Loam, clay loam	CL	A-4, A-6, A-7	0-3	0-5	90-100	85-100	75-100	50-95	28-45	8-20
	32-60	Loam, clay loam	CL	A-4, A-6, A-7	0-3	0-5	90-100	85-100	75-100	50-95	28-45	8-20
Prosper-----	0-8	Loam	CL	A-4, A-6	0	0	95-100	95-100	80-100	50-90	28-35	9-15
	8-30	Clay loam, silty clay loam	ML, CL	A-6, A-7	0	0	95-100	95-100	85-100	60-90	35-50	10-25
	30-39	Clay loam, loam	CL	A-6, A-7	0	0-5	95-100	95-100	80-95	55-85	30-50	10-25
	39-80	Clay loam, loam	CL	A-6, A-7	0	0-5	95-100	95-100	80-95	55-85	30-50	10-25
HtC:												
Houdek-----	0-6	Loam	CL	A-4, A-6, A-7	0	0-5	95-100	95-100	85-100	70-85	30-45	8-20
	6-19	Clay loam	CL, ML	A-6, A-7	0	0-5	95-100	95-100	85-100	60-80	35-50	10-25
	19-42	Clay loam, loam	CL, ML	A-6, A-7	0-1	0-10	95-100	95-100	85-100	60-80	35-50	10-25
	42-80	Clay loam, loam	CL	A-6, A-7	0	0-5	90-100	90-100	80-100	55-80	30-50	10-25
Ethan-----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0-5	95-100	90-100	85-100	55-85	25-40	5-20
	8-20	Loam, clay loam	CL	A-6, A-7	0-3	0-5	95-100	90-100	80-100	55-80	30-50	10-25
	20-32	Loam, clay loam	CL	A-4, A-6, A-7	0-3	0-5	90-100	85-100	75-100	50-95	28-45	8-20
	32-60	Loam, clay loam	CL	A-4, A-6, A-7	0-3	0-5	90-100	85-100	75-100	50-95	28-45	8-20
Prosper-----	0-8	Loam	CL	A-4, A-6	0	0	95-100	95-100	80-100	50-90	28-35	9-15
	8-30	Clay loam, silty clay loam	ML, CL	A-6, A-7	0	0	95-100	95-100	85-100	60-90	35-50	10-25
	30-39	Clay loam, loam	CL	A-6, A-7	0	0-5	95-100	95-100	80-95	55-85	30-50	10-25
	39-80	Clay loam, loam	CL	A-7, A-6	0	0-5	95-100	95-100	80-95	55-85	30-50	10-25
HuA:												
Houdek-----	0-6	Loam	CL	A-4, A-6, A-7	0	0-5	95-100	95-100	85-100	70-85	30-45	8-20
	6-19	Clay loam	CL, ML	A-6, A-7	0	0-5	95-100	95-100	85-100	60-80	35-50	10-25
	19-42	Clay loam, loam	ML, CL	A-6, A-7	0-1	0-10	95-100	95-100	85-100	60-80	35-50	10-25
	42-80	Clay loam, loam	CL	A-6, A-7	0	0-5	90-100	90-100	80-100	55-80	30-50	10-25
Prosper-----	0-8	Loam	CL	A-4, A-6	0	0	95-100	95-100	80-100	50-90	28-35	9-15
	8-30	Clay loam, silty clay loam	CL, ML	A-6, A-7	0	0	95-100	95-100	85-100	60-90	35-50	10-25
	30-39	Clay loam, loam	CL	A-6, A-7	0	0-5	95-100	95-100	80-95	55-85	30-50	10-25
	39-80	Clay loam, loam	CL	A-6, A-7	0	0-5	95-100	95-100	80-95	55-85	30-50	10-25

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	<i>In</i>				<i>Pct</i>	<i>Pct</i>					<i>Pct</i>	
HuB:												
Houdek-----	0-6	Loam	CL	A-4, A-6, A-7	0	0-5	95-100	95-100	85-100	70-85	30-45	8-20
	6-19	Clay loam	ML, CL	A-6, A-7	0	0-5	95-100	95-100	85-100	60-80	35-50	10-25
	19-42	Clay loam, loam	ML, CL	A-6, A-7	0-1	0-10	95-100	95-100	85-100	60-80	35-50	10-25
	42-80	Clay loam, loam	CL	A-6, A-7	0	0-5	90-100	90-100	80-100	55-80	30-50	10-25
Prosper-----												
	0-8	Loam	CL	A-4, A-6	0	0	95-100	95-100	80-100	50-90	28-35	9-15
	8-30	Clay loam, silty clay loam	ML, CL	A-6, A-7	0	0	95-100	95-100	85-100	60-90	35-50	10-25
	30-39	Clay loam, loam	CL	A-6, A-7	0	0-5	95-100	95-100	80-95	55-85	30-50	10-25
	39-80	Clay loam, loam	CL	A-6, A-7	0	0-5	95-100	95-100	80-95	55-85	30-50	10-25
HwA:												
Houdek-----	0-6	Loam	CL	A-4, A-6, A-7	0	0-5	95-100	95-100	85-100	70-85	30-45	8-20
	6-19	Clay loam	ML, CL	A-6, A-7	0	0-5	95-100	95-100	85-100	60-80	35-50	10-25
	19-42	Clay loam, loam	ML, CL	A-6, A-7	0-1	0-10	95-100	95-100	85-100	60-80	35-50	10-25
	42-80	Clay loam, loam	CL	A-6, A-7	0	0-5	90-100	90-100	80-100	55-80	30-50	10-25
Stickney-----												
	0-10	Silt loam	CL, ML	A-4, A-6, A-7	0	0	95-100	95-100	85-100	85-95	30-50	8-20
	10-22	Clay loam, silty clay loam, clay	CL, MH, ML, CH	A-7	0	0	95-100	95-100	85-100	65-95	40-60	14-34
	22-80	Clay loam, loam	ML, CL, CH, MH	A-6, A-7	0	0-5	95-100	90-100	80-100	55-90	35-60	10-35
HxA:												
Houdek-----	0-6	Loam	CL	A-4, A-6, A-7	0	0-5	95-100	95-100	85-100	70-85	30-45	8-20
	6-19	Clay loam	ML, CL	A-6, A-7	0	0-5	95-100	95-100	85-100	60-80	35-50	10-25
	19-42	Clay loam, loam	CL, ML	A-6, A-7	0-1	0-10	95-100	95-100	85-100	60-80	35-50	10-25
	42-80	Clay loam, loam	CL	A-6, A-7	0	0-5	90-100	90-100	80-100	55-80	30-50	10-25
Stickney-----												
	0-10	Silt loam	CL, ML	A-4, A-6, A-7	0	0	95-100	95-100	85-100	85-95	30-50	8-20
	10-22	Clay loam, silty clay loam, clay	CH, ML, MH, CL	A-7	0	0	95-100	95-100	85-100	65-95	40-60	14-34
	22-80	Clay loam, loam	ML, MH, CL, CH	A-6, A-7	0	0-5	95-100	90-100	80-100	55-90	35-60	10-35
Tetonka-----												
	0-13	Silt loam	ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	80-100	27-50	8-20
	13-39	Clay, silty clay, clay loam	MH, ML, CH, CL	A-7	0	0	95-100	95-100	85-100	65-100	40-70	15-35
	39-80	Clay loam, silty clay, clay	CL, CH	A-6, A-7	0	0	95-100	95-100	80-100	55-95	30-60	11-30

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Hy:												
Hoven-----	0-3	Silt loam	CL, CL-ML, ML	A-4, A-6, A-7	0	0	100	100	90-100	75-95	27-45	5-20
	3-6	Silty clay, clay, clay loam	ML, MH, CL, CH	A-7	0	0	100	95-100	95-100	80-100	45-80	20-40
	6-22	Silty clay, clay, clay loam	ML, CL, CH, MH	A-7	0	0	100	95-100	95-100	80-100	45-80	20-40
	22-80	Silty clay, clay, silty clay loam	CL, CH	A-6, A-7	0	0	95-100	90-100	80-100	60-100	35-75	11-45
Ie:												
Ipage-----	0-6	Fine sand	SC-SM, SM, SP-SM	A-2, A-3	0	0	100	100	50-100	5-30	0-10	NP-5
	6-61	Fine sand, loamy fine sand, sand	SC-SM, SM, SP-SM	A-2, A-3	0	0	100	100	50-100	5-35	0-10	NP-5
	61-80	Clay loam, loam	CL-ML, CL, ML	A-6, A-4	0	0	100	100	85-95	60-80	35-45	15-25
Els-----	0-7	Fine sand	SP-SM, SM	A-2, A-3	0	0	100	100	70-100	5-35	0-10	NP
	7-49	Fine sand, loamy fine sand, sand	SM, SP, SC-SM	A-2, A-3	0	0	90-100	90-100	70-100	4-30	0-10	NP
	49-80	Clay loam, loam	ML, CL-ML, CL	A-4, A-6	0	0	100	100	85-95	60-80	35-45	15-25
Shue-----	0-8	Loamy fine sand	SC-SM, SM	A-2, A-3	0	0	100	95-100	75-100	5-35	15-25	NP-5
	8-26	Loamy sand, loamy fine sand, fine sand	SP-SM, SM, SC-SM	A-2, A-3	0	0	100	95-100	75-100	5-35	10-25	NP-5
	26-80	Loam, clay loam	CL	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	50-80	30-45	5-20
Jh:												
Jerauld-----	0-2	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	60-100	25-40	5-15
	2-14	Silty clay, clay, clay loam	CL, CH	A-7	0	0	95-100	95-100	90-100	55-95	45-70	20-40
	14-33	Silty clay, clay, clay loam	CL, CH	A-7	0	0	95-100	95-100	90-100	55-95	45-70	20-40
	33-80	Silty clay, clay, clay loam	ML, MH, CL, CH	A-7	0	0	95-100	95-100	85-100	55-90	40-85	20-45
Hoven-----	0-3	Silt loam	CL, CL-ML, ML	A-4, A-6, A-7	0	0	100	100	90-100	75-95	27-45	5-20
	3-6	Silty clay, clay, clay loam	CH, CL, MH, ML	A-7	0	0	100	95-100	95-100	80-100	45-80	20-40
	6-22	Silty clay, clay, clay loam	CH, CL, ML, MH	A-7	0	0	100	95-100	95-100	80-100	45-80	20-40
	22-80	Silty clay, clay, silty clay loam	CH, CL	A-6, A-7	0	0	95-100	90-100	80-100	60-100	35-75	11-45

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
KaA:												
Kranzburg-----	0-7	Silt loam	CL, ML	A-6, A-7	0	0	100	100	95-100	85-100	35-45	10-20
	7-14	Silty clay loam, silt loam	CL, CH	A-7	0	0	100	100	95-100	85-100	40-55	15-30
	14-26	Silty clay loam, silt loam	CL, CH	A-7	0	0	100	100	95-100	85-100	40-55	15-30
	26-48	Clay loam, loam	CL	A-6, A-7	0	0	95-100	90-100	80-100	65-85	30-50	10-30
	48-80	Clay loam, loam	CL	A-6, A-7	0	0	95-100	90-100	80-100	65-85	30-50	10-30
Brookings-----												
	0-15	Silt loam	ML, CL	A-4, A-6	0	0	100	100	95-100	85-100	30-40	7-15
	15-26	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	95-100	90-100	35-50	15-25
	26-35	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	35-50	15-25
	35-80	Loam, clay loam	CL	A-6, A-7	0-5	0	100	95-100	85-100	70-85	35-50	15-25
KbB:												
Kranzburg-----	0-7	Silt loam	ML, CL	A-6, A-7	0	0	100	100	95-100	85-100	35-45	10-20
	7-14	Silty clay loam, silt loam	CL, CH	A-7	0	0	100	100	95-100	85-100	40-55	15-30
	14-26	Silty clay loam, silt loam	CH, CL	A-7	0	0	100	100	95-100	85-100	40-55	15-30
	26-48	Clay loam, loam	CL	A-6, A-7	0	0	95-100	90-100	80-100	65-85	30-50	10-30
	48-80	Clay loam, loam	CL	A-6, A-7	0	0	95-100	90-100	80-100	65-85	30-50	10-30
Brookings-----												
	0-15	Silt loam	ML, CL	A-4, A-6	0	0	100	100	95-100	85-100	30-40	7-15
	15-26	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	95-100	90-100	35-50	15-25
	26-35	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	35-50	15-25
	35-80	Loam, clay loam	CL	A-6, A-7	0-5	0	100	95-100	85-100	70-85	35-50	15-25
Buse-----												
	0-7	Loam	ML, CL-ML, CL	A-4, A-6	0	0	90-100	85-95	70-95	55-90	20-35	3-15
	7-35	Loam, clay loam	ML, CL, CL-ML	A-4, A-6, A-7	0	0	90-100	85-100	70-90	55-85	25-45	5-20
	35-80	Loam, clay loam	ML, CL-ML, CL	A-4, A-6, A-7	0	0	90-100	85-100	70-90	55-85	25-45	5-20
KcA:												
Kranzburg-----	0-7	Silt loam	CL, ML	A-6, A-7	0	0	100	100	95-100	85-100	35-45	10-20
	7-14	Silty clay loam, silt loam	CL, CH	A-7	0	0	100	100	95-100	85-100	40-55	15-30
	14-26	Silty clay loam, silt loam	CH, CL	A-7	0	0	100	100	95-100	85-100	40-55	15-30
	26-48	Clay loam, loam	CL	A-6, A-7	0	0	95-100	90-100	80-100	65-85	30-50	10-30
	48-80	Clay loam, loam	CL	A-6, A-7	0	0	95-100	90-100	80-100	65-85	30-50	10-30

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
					Pct	Pct						
	In				Pct	Pct					Pct	
KcA: (cont.)												
Cresbard-----	0-8	Silt loam	CL	A-6, A-7	0	0	100	100	90-100	70-95	30-45	10-20
	8-11	Clay loam, silty clay loam	CL, ML	A-6, A-7	0	0	100	90-100	90-100	70-85	35-50	10-25
	11-22	Clay loam, silty clay, clay	CH, CL	A-6, A-7	0	0	95-100	90-100	85-100	65-85	30-60	15-30
	22-38	Clay loam, silty clay, clay	CL, CH	A-7	0	0	95-100	90-100	85-100	65-85	40-60	15-30
	38-80	Clay loam, loam, silt loam	ML, MH, CH, CL	A-6, A-7	0	0-5	95-100	90-100	85-100	50-95	25-55	10-25
KtA:												
Kranzburg-----	0-7	Silt loam	ML, CL	A-6, A-7	0	0	100	100	95-100	85-100	35-45	10-20
	7-14	Silty clay loam, silt loam	CL, CH	A-7	0	0	100	100	95-100	85-100	40-55	15-30
	14-26	Silty clay loam, silt loam	CH, CL	A-7	0	0	100	100	95-100	85-100	40-55	15-30
	26-48	Clay loam, loam	CL	A-6, A-7	0	0	95-100	90-100	80-100	65-85	30-50	10-30
	48-80	Clay loam, loam	CL	A-6, A-7	0	0	95-100	90-100	80-100	65-85	30-50	10-30
Cresbard-----	0-8	Silt loam	CL	A-6, A-7	0	0	100	100	90-100	70-95	30-45	10-20
	8-11	Clay loam, silty clay loam	ML, CL	A-6, A-7	0	0	100	90-100	90-100	70-85	35-50	10-25
	11-22	Clay loam, silty clay, clay	CH, CL	A-6, A-7	0	0	95-100	90-100	85-100	65-85	30-60	15-30
	22-38	Clay loam, silty clay, clay	CH, CL	A-7	0	0	95-100	90-100	85-100	65-85	40-60	15-30
	38-80	Clay loam, loam, silt loam	MH, CL, ML, CH	A-6, A-7	0	0-5	95-100	90-100	85-100	50-95	25-55	10-25
Tonka-----	0-16	Silt loam	CL-ML, CL	A-4, A-6	0-1	0-2	100	95-100	90-100	70-90	35-45	15-25
	16-41	Silty clay loam, clay loam, silty clay	CL, CH	A-6, A-7	0-1	0-2	100	95-100	90-100	75-95	50-60	30-40
	41-80	Silty clay loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0-1	0-3	90-100	85-100	60-100	50-90	35-55	15-30
KzB:												
Kranzburg-----	0-7	Silt loam	ML, CL	A-6, A-7	0	0	100	100	95-100	85-100	35-45	10-20
	7-14	Silty clay loam, silt loam	CH, CL	A-7	0	0	100	100	95-100	85-100	40-55	15-30
	14-26	Silty clay loam, silt loam	CH, CL	A-7	0	0	100	100	95-100	85-100	40-55	15-30
	26-48	Clay loam, loam	CL	A-6, A-7	0	0	95-100	90-100	80-100	65-85	30-50	10-30
	48-80	Clay loam, loam	CL	A-6, A-7	0	0	95-100	90-100	80-100	65-85	30-50	10-30

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
KzB: (cont.)												
Zell-----	0-7	Silt loam	CL, ML	A-4, A-6	0	0	100	95-100	90-100	80-100	30-40	5-15
	7-31	Silt loam, very fine sandy loam, loam	CL-ML, CL	A-4, A-6	0	0	100	95-100	85-100	70-100	25-40	5-15
	31-80	Silt loam, very fine sandy loam, loam	ML, CL-ML	A-4	0	0	100	95-100	85-100	60-100	15-25	NP-7
Aastad-----	0-14	Loam	ML, CL	A-6, A-7	0	0-5	95-100	95-100	80-95	50-75	35-45	10-20
	14-29	Clay loam	CL	A-7	0	0-5	95-100	90-100	75-95	50-75	40-50	15-25
	29-80	Clay loam, loam	CL	A-6, A-7	0	0-5	95-100	85-100	75-95	55-75	35-50	12-25
La:												
La Prairie-----	0-13	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-95	70-80	25-40	5-15
	13-33	Silt loam, loam, silty clay loam	CL, CL-ML	A-4, A-6, A-7	0	0	100	100	85-100	50-90	25-50	5-25
	33-44	Silt loam, loam, silty clay loam	CL, CL-ML	A-4, A-6, A-7	0	0	100	100	85-100	70-95	25-50	5-25
	44-80	Stratified loamy sand to silt loam to silty clay loam	SC-SM, SC, CL, CL-ML	A-4, A-6, A-7	0	0	100	95-100	75-100	45-90	25-50	5-25
Lc:												
La Prairie, channeled-----	0-13	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-95	70-80	25-40	5-15
	13-33	Silt loam, loam, silty clay loam	CL, CL-ML	A-4, A-6, A-7	0	0	100	100	85-100	50-90	25-50	5-25
	33-44	Silt loam, loam, silty clay loam	CL-ML, CL	A-4, A-6, A-7	0	0	100	100	85-100	70-95	25-50	5-25
	44-80	Stratified loamy sand to silt loam to silty clay loam	CL, SC, SC- SM, CL-ML	A-4, A-6, A-7	0	0	100	95-100	75-100	45-90	25-50	5-25
Holmquist, channeled-----	0-7	Loam	CL	A-6	0	0	100	95-100	85-95	55-80	30-40	10-15
	7-80	Stratified sand to sandy loam to clay loam	CL, CL-ML	A-4, A-6, A-7	0	0	100	95-100	75-95	50-80	25-45	5-20
Ld:												
LaDelle-----	0-19	Silt loam	CL, ML	A-4, A-6, A-7	0	0	100	100	90-100	80-100	30-45	7-20
	19-48	Silt loam, silty clay loam, loam	CL, CH, MH, ML	A-6, A-7	0	0	100	100	90-100	75-100	30-55	10-25
	48-80	Stratified silt loam to clay loam	CL, CL-ML	A-4, A-6, A-7	0	0	100	100	90-100	75-100	25-50	5-25

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Le: LaDelle, channeled-----	0-19	Silt loam	CL, ML	A-4, A-6, A-7	0	0	100	100	90-100	80-100	30-45	7-20
	19-48	Silt loam, silty clay loam, loam	CH, CL, MH, ML	A-6, A-7	0	0	100	100	90-100	75-100	30-55	10-25
	48-80	Stratified silt loam to clay loam	CL-ML, CL	A-4, A-6, A-7	0	0	100	100	90-100	75-100	25-50	5-25
Lk: Lamo-----	0-22	Silty clay loam	CH, CL	A-4, A-6, A-7	0	0	100	100	95-100	80-95	25-55	8-25
	22-80	Silty clay loam, silt loam	CL, CH	A-6, A-7	0	0	100	100	95-100	85-95	30-55	11-25
Lm: Lamoure-----	0-19	Silty clay loam	CH, CL, MH, ML	A-7	0	0	100	100	95-100	85-100	45-70	20-35
	19-38	Silty clay loam, silt loam	CL, MH, ML, CH	A-7	0	0	100	100	90-100	85-100	40-70	15-35
	38-55	Silty clay loam, silt loam, loam	CL, ML	A-6, A-7	0	0	95-100	95-100	90-100	75-100	30-50	10-20
	55-80	Stratified sandy loam to silty clay loam	SC, CL	A-6, A-7	0	0	95-100	95-100	70-95	35-90	30-50	10-25
Ln: Lawet-----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0	100	100	85-100	50-75	20-40	5-15
	8-51	Clay loam, loam, fine sandy loam	CL, SC	A-4, A-6	0	0	100	100	70-100	35-75	20-35	8-20
	51-80	Stratified fine sand to loam	SM, SC-SM, CL-ML, ML	A-2, A-4	0	0	100	100	60-100	20-60	15-20	NP-5
Lo: Lawet, wet-----	0-8	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	50-75	20-40	5-15
	8-51	Clay loam, loam, fine sandy loam	CL, SC	A-4, A-6	0	0	100	100	70-100	35-75	20-35	8-20
	51-80	Stratified fine sand to loam	CL-ML, SC-SM, SM, ML	A-2, A-4	0	0	100	100	60-100	20-60	15-20	NP-5
Lp: Lawet-----	0-8	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	50-75	20-40	5-15
	8-51	Clay loam, loam, fine sandy loam	CL, SC	A-4, A-6	0	0	100	100	70-100	35-75	20-35	8-20
	51-80	Stratified fine sand to loam	SM, CL-ML, ML, SC-SM	A-2, A-4	0	0	100	100	60-100	20-60	15-20	NP-5

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Lp: (cont.) Davison-----	0-8	Loam	CL	A-6	0	0	95-100	95-100	85-95	60-85	25-40	10-20
	8-28	Loam, clay loam, sandy loam	SC-SM, SC, CL-ML, CL	A-4, A-6	0	0-5	95-100	95-100	85-100	45-80	25-40	5-20
	28-53	Loam, clay loam	CL-ML, CL	A-4, A-6	0	0-5	95-100	95-100	85-100	60-80	25-40	5-20
	53-80	Stratified sandy loam to clay loam	SC, CL-ML, CL, SC-SM	A-4, A-6	0	0-5	90-100	80-100	65-95	40-75	20-35	5-15
LrA: Lehr-----	0-7	Loam	ML, CL, CL-ML	A-4, A-6	0	0	95-100	95-100	85-95	60-80	20-40	3-15
	7-19	Loam, clay loam, gravelly loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0-2	0-5	90-100	80-100	75-95	40-75	25-40	5-15
	19-80	Very gravelly loamy sand, gravelly sand, very gravelly coarse sand	GM, SM, SP, GP	A-1	0-2	0-5	40-80	25-60	10-35	2-15	0-14	NP
Bowdle-----	0-10	Loam	ML, CL	A-4, A-6	0	0	100	95-100	85-95	55-80	30-40	7-15
	10-24	Loam, clay loam	CL, ML	A-4, A-6	0	0	95-100	90-100	70-95	50-75	30-40	7-15
	24-29	Gravelly loam, sandy loam, loam	CL-ML, ML, SM, SC-SM	A-2, A-4	0	0	90-100	80-100	60-95	30-60	25-35	5-10
	29-80	Very gravelly sand, gravelly loamy sand, very gravelly loamy sand	SM, SW-SM	A-1, A-2	0	0-5	60-95	50-85	25-50	5-30	15-25	NP-5
LrB: Lehr-----	0-7	Loam	CL, CL-ML, ML	A-4, A-6	0	0	95-100	95-100	85-95	60-80	20-40	3-15
	7-19	Loam, clay loam, gravelly loam	CL-ML, SC, SC-SM, CL	A-4, A-6	0-2	0-5	90-100	80-100	75-95	40-75	25-40	5-15
	19-80	Very gravelly loamy sand, gravelly sand, very gravelly coarse sand	SP, SM, GM, GP	A-1	0-2	0-5	40-80	25-60	10-35	2-15	0-14	NP
Bowdle-----	0-10	Loam	CL, ML	A-4, A-6	0	0	100	95-100	85-95	55-80	30-40	7-15
	10-24	Loam, clay loam	CL, ML	A-4, A-6	0	0	95-100	90-100	70-95	50-75	30-40	7-15
	24-29	Gravelly loam, sandy loam, loam	SM, SC-SM, ML, CL-ML	A-2, A-4	0	0	90-100	80-100	60-95	30-60	25-35	5-10
	29-80	Very gravelly sand, gravelly loamy sand, very gravelly loamy sand	SM, SW-SM	A-1, A-2	0	0-5	60-95	50-85	25-50	5-30	15-25	NP-5

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Ls:												
Lowe-----	0-7	Loam	CL, ML	A-4, A-6, A-7	0	0	100	100	90-100	60-75	30-45	5-20
	7-34	Clay loam, loam, silt loam	CL	A-6, A-7	0	0	100	100	90-100	60-85	35-50	11-25
	34-80	Stratified loamy sand to silty clay loam	CL, ML, SM, SC	A-4, A-6, A-7	0	0	100	100	85-100	45-75	30-45	5-20
Lt:												
Ludden-----	0-14	Silty clay	CH	A-7	0	0	100	100	95-100	75-95	50-75	25-50
	14-41	Silty clay, clay	CH	A-7	0	0	100	100	95-100	75-95	50-75	25-50
	41-80	Silty clay, clay, clay loam	CH	A-7	0	0	100	100	95-100	75-95	50-75	25-50
Lu:												
Ludden, ponded--	0-14	Silty clay	CH	A-7	0	0	100	100	95-100	75-95	50-75	25-50
	14-41	Silty clay, clay	CH	A-7	0	0	100	100	95-100	75-95	50-75	25-50
	41-80	Silty clay, clay, clay loam	CH	A-7	0	0	100	100	95-100	75-95	50-75	25-50
Lw:												
Ludden, wet-----	0-14	Silty clay	CH	A-7	0	0	100	100	95-100	75-95	50-75	25-50
	14-41	Silty clay, clay	CH	A-7	0	0	100	100	95-100	75-95	50-75	25-50
	41-80	Silty clay, clay, clay loam	CH	A-7	0	0	100	100	95-100	75-95	50-75	25-50
M-W:												
Miscellaneous water-----	---	---	---	---	---	---	---	---	---	---	---	---
MaC:												
Maddock-----	0-9	Sandy loam	SM	A-2, A-4	0	0	100	100	60-85	30-50	---	NP
	9-80	Loamy sand, loamy fine sand, sand	SM, SP-SM	A-2, A-3	0	0	95-100	95-100	60-100	5-35	---	NP
Egeland-----	0-8	Sandy loam	SC-SM, SM	A-2, A-4	0	0	100	95-100	75-100	30-50	15-25	NP-7
	8-31	Sandy loam, fine sandy loam	SM, SC-SM	A-2, A-4	0	0	95-100	85-100	70-100	15-50	15-25	NP-7
	31-64	Loamy sand, loamy fine sand, loamy very fine sand	SP-SM, SM, SC-SM	A-2, A-4	0	0	95-100	85-100	70-100	10-45	15-25	NP-5
	64-80	Stratified fine sand to silt loam	SC-SM, SM, ML	A-2, A-4	0	0	95-100	85-100	65-90	30-80	15-25	NP-5

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
MdA:												
Max-----	0-14	Loam	CL, CL-ML, ML	A-4, A-6, A-7	0	0-3	95-100	90-100	85-95	60-75	25-45	3-23
	14-80	Loam, clay loam	ML, CL, CL-ML	A-4, A-6, A-7	0	0-3	95-100	90-100	85-100	60-80	25-45	3-23
Arnegard-----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0	100	100	85-95	60-85	20-35	5-20
	8-25	Loam, clay loam	CL	A-6	0	0	100	100	90-100	60-95	25-40	12-25
	25-80	Loam, clay loam, fine sandy loam	CL, SM, SC, ML	A-4, A-6	0	0	100	100	75-95	40-80	15-40	NP-15
MdB:												
Max-----	0-14	Loam	CL, CL-ML, ML	A-4, A-6, A-7	0	0-3	95-100	90-100	85-95	60-75	25-45	3-23
	14-80	Loam, clay loam	CL, CL-ML, ML	A-4, A-6, A-7	0	0-3	95-100	90-100	85-100	60-80	25-45	3-23
Arnegard-----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0	100	100	85-95	60-85	20-35	5-20
	8-25	Loam, clay loam	CL	A-6	0	0	100	100	90-100	60-95	25-40	12-25
	25-80	Loam, clay loam, fine sandy loam	CL, ML, SM, SC	A-4, A-6	0	0	100	100	75-95	40-80	15-40	NP-15
MgB:												
Max-----	0-14	Loam	CL-ML, ML, CL	A-4, A-6, A-7	0	0-3	95-100	90-100	85-95	60-75	25-45	3-23
	14-80	Loam, clay loam	CL-ML, CL, ML	A-4, A-6, A-7	0	0-3	95-100	90-100	85-100	60-80	25-45	3-23
Arnegard-----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0	100	100	85-95	60-85	20-35	5-20
	8-25	Loam, clay loam	CL	A-6	0	0	100	100	90-100	60-95	25-40	12-25
	25-80	Loam, clay loam, fine sandy loam	SM, CL, SC, ML	A-4, A-6	0	0	100	100	75-95	40-80	15-40	NP-15
Zahl-----	0-8	Loam	CL	A-6	0	0-1	95-100	95-100	80-95	55-75	25-40	10-20
	8-29	Loam, clay loam	CL-ML, CL	A-4, A-6, A-7	0	0-1	90-100	85-100	80-95	55-80	25-50	5-30
	29-80	Clay loam, loam	CL, CL-ML	A-4, A-6, A-7	0	0-1	90-100	85-100	80-95	55-80	25-50	5-30
MnB:												
Max-----	0-14	Loam	CL, CL-ML, ML	A-4, A-6, A-7	0	0-3	95-100	90-100	85-95	60-75	25-45	3-23
	14-80	Loam, clay loam	ML, CL-ML, CL	A-4, A-6, A-7	0	0-3	95-100	90-100	85-100	60-80	25-45	3-23
Niobell-----	0-12	Loam	ML, CL-ML, CL	A-4, A-6	0	0	95-100	95-100	85-95	60-75	25-38	3-15
	12-28	Clay loam, loam	CH, CL	A-6, A-7	0	0-1	95-100	95-100	90-100	70-80	30-60	15-35
	28-80	Loam, clay loam	ML, CL, CL-ML	A-4, A-6	0	0-1	95-100	95-100	85-95	60-75	25-40	3-18
Noonan-----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0-1	95-100	95-100	80-95	55-75	20-38	5-20
	8-18	Clay loam	CL, CH	A-6, A-7	0	0-1	95-100	95-100	85-95	65-85	25-60	10-35
	18-80	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-1	90-100	85-100	75-95	60-85	25-50	5-30

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
MxC:												
Max-----	0-14	Loam	ML, CL-ML, CL	A-4, A-6, A-7	0	0-3	95-100	90-100	85-95	60-75	25-45	3-23
	14-80	Loam, clay loam	CL-ML, CL, ML	A-4, A-6, A-7	0	0-3	95-100	90-100	85-100	60-80	25-45	3-23
Zahl-----	0-8	Loam	CL	A-6	0	0-1	95-100	95-100	80-95	55-75	25-40	10-20
	8-29	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-1	90-100	85-100	80-95	55-80	25-50	5-30
	29-80	Clay loam, loam	CL, CL-ML	A-4, A-6, A-7	0	0-1	90-100	85-100	80-95	55-80	25-50	5-30
Arnegard-----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0	100	100	85-95	60-85	20-35	5-20
	8-25	Loam, clay loam	CL	A-6	0	0	100	100	90-100	60-95	25-40	12-25
	25-80	Loam, clay loam, fine sandy loam	CL, ML, SM, SC	A-4, A-6	0	0	100	100	75-95	40-80	15-40	NP-15
My:												
Miranda-----	0-3	Loam	CL	A-6	0	0	100	95-100	85-95	60-85	25-40	5-15
	3-13	Clay loam	CH, CL	A-7, A-6	0	0-2	95-100	95-100	85-100	70-80	30-50	15-30
	13-80	Clay loam, loam	CL-ML, CL	A-7, A-6	0	0-2	95-100	95-100	85-100	70-80	25-50	15-30
Heil-----	0-2	Silt loam	CL	A-6, A-7	0	0	100	100	90-100	70-100	25-45	10-25
	2-24	Silty clay, clay	CH	A-7	0	0	100	100	90-100	75-100	50-75	25-45
	24-80	Silty clay, silty clay loam, clay loam	CL, CH	A-6, A-7	0	0	100	100	85-100	60-100	25-75	11-45
Mz:												
Moritz-----	0-12	Loam	CL	A-6	0	0	100	100	85-100	60-75	30-40	10-20
	12-44	Loam, clay loam, silt loam	CL	A-6, A-7	0	0	100	100	90-100	60-80	35-50	11-25
	44-80	Stratified loamy sand to silty clay loam	CL, ML, SC-SM	A-4, A-6, A-7	0	0	100	100	85-95	45-75	20-45	3-20
Lowe-----	0-7	Loam	CL, ML	A-4, A-6, A-7	0	0	100	100	90-100	60-75	30-45	5-20
	7-34	Clay loam, loam, silt loam	CL	A-6, A-7	0	0	100	100	90-100	60-85	35-50	11-25
	34-80	Stratified loamy sand to silty clay loam	SC, SM, ML, CL	A-4, A-6, A-7	0	0	100	100	85-100	45-75	30-45	5-20

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Na:												
Nahon-----	0-7	Silt loam	CL, ML	A-4, A-6, A-7	0	0	100	100	90-100	80-100	30-45	5-20
	7-9	Silty clay loam, silt loam	CL, ML	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-25
	9-21	Silty clay, silty clay loam	ML, CL, CH, MH	A-7	0	0	100	100	95-100	90-100	45-65	15-35
	21-43	Silty clay, silty clay loam, silt loam	ML, MH, CL, CH	A-6, A-7	0	0	100	100	90-100	80-100	30-65	10-30
	43-49	Stratified very fine sand to silty clay loam to clay	CH, CL, MH, ML	A-7	0	0	100	100	90-100	75-100	40-70	15-35
	49-80	Clay loam, loam	CL	A-6, A-7	0-5	0-5	95-100	90-100	80-100	65-85	30-50	10-30
Aberdeen-----	0-13	Silt loam	ML, CL	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-25
	13-23	Silty clay, clay, silty clay loam	ML, MH	A-7	0	0	100	100	95-100	90-100	45-75	15-40
	23-39	Silty clay loam, silty clay	MH, CL, ML, CH	A-6, A-7	0	0	100	100	95-100	85-100	35-65	15-30
	39-80	Stratified very fine sand to silt loam to clay	CL-ML, CL, CH, ML	A-4, A-6, A-7	0	0	100	100	95-100	85-100	20-56	3-33
Exline-----	0-2	Silt loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-45	10-20
	2-21	Clay, silty clay, silty clay loam	CH, MH	A-7	0	0	100	100	95-100	90-100	60-90	30-50
	21-40	Silty clay loam, silty clay, clay	MH, CH	A-7	0	0	100	100	95-100	85-100	50-80	20-45
	40-80	Stratified very fine sand to silty clay loam to clay	CL, CH	A-7	0	0	100	100	95-100	85-100	40-60	15-30
Nb:												
Nahon-----	0-7	Silt loam	ML, CL	A-4, A-6, A-7	0	0	100	100	90-100	80-100	30-45	5-20
	7-9	Silty clay loam, silt loam	ML, CL	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-25
	9-21	Silty clay, silty clay loam	CH, CL, ML, MH	A-7	0	0	100	100	95-100	90-100	45-65	15-35
	21-43	Silty clay, silty clay loam, silt loam	ML, MH, CL, CH	A-6, A-7	0	0	100	100	90-100	80-100	30-65	10-30
	43-49	Stratified very fine sand to silty clay loam to clay	CH, CL, MH, ML	A-7	0	0	100	100	90-100	75-100	40-70	15-35
	49-80	Clay loam, loam	CL	A-6, A-7	0-5	0-5	95-100	90-100	80-100	65-85	30-50	10-30

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Nb: (cont.)												
Aberdeen-----	0-11	Silt loam	CL, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-45	7-20
	11-23	Silty clay, clay, silty clay loam	ML, MH	A-7	0	0	100	100	95-100	90-100	45-75	15-40
	23-36	Silty clay loam, silty clay	MH, CH, CL, ML	A-6, A-7	0	0	100	100	95-100	85-100	35-65	15-30
	36-49	Stratified very fine sand to silt loam to clay	CL, ML, CL-ML	A-4, A-6, A-7	0	0	100	100	95-100	85-100	20-50	3-25
	49-80	Clay loam, loam	CL	A-6, A-7	0-5	0-5	95-100	90-100	80-100	65-85	30-50	10-30
Exline-----	0-2	Silt loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-45	10-20
	2-24	Clay, silty clay, silty clay loam	CH, MH	A-7	0	0	100	100	95-100	90-100	60-90	30-50
	24-39	Silty clay loam, silty clay, clay	MH, CH	A-7	0	0	100	100	95-100	85-100	50-80	20-45
	39-55	Stratified very fine sand to silty clay loam to clay	CH, CL	A-7	0	0	100	100	95-100	85-100	40-60	15-30
	55-80	Clay loam, loam	CL	A-6, A-7	0-5	0-5	95-100	90-100	80-100	65-85	30-50	10-30
Nc:												
Niobell-----	0-12	Loam	CL, ML, CL-ML	A-4, A-6	0	0	95-100	95-100	85-95	60-75	25-38	3-15
	12-28	Clay loam, loam	CL, CH	A-6, A-7	0	0-1	95-100	95-100	90-100	70-80	30-60	15-35
	28-80	Loam, clay loam	ML, CL-ML, CL	A-4, A-6	0	0-1	95-100	95-100	85-95	60-75	25-40	3-18
Noonan-----	0-8	Loam	CL, CL-ML	A-4, A-6	0	0-1	95-100	95-100	80-95	55-75	20-38	5-20
	8-18	Clay loam	CL, CH	A-6, A-7	0	0-1	95-100	95-100	85-95	65-85	25-60	10-35
	18-80	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-1	90-100	85-100	75-95	60-85	25-50	5-30
Nd:												
Niobell-----	0-12	Loam	ML, CL-ML, CL	A-4, A-6	0	0	95-100	95-100	85-95	60-75	25-38	3-15
	12-28	Clay loam, loam	CH, CL	A-6, A-7	0	0-1	95-100	95-100	90-100	70-80	30-60	15-35
	28-80	Loam, clay loam	CL, CL-ML, ML	A-4, A-6	0	0-1	95-100	95-100	85-95	60-75	25-40	3-18
Noonan-----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0-1	95-100	95-100	80-95	55-75	20-38	5-20
	8-18	Clay loam	CH, CL	A-6, A-7	0	0-1	95-100	95-100	85-95	65-85	25-60	10-35
	18-80	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-1	90-100	85-100	75-95	60-85	25-50	5-30
Heil-----	0-2	Silt loam	CL	A-6, A-7	0	0	100	100	90-100	70-100	25-45	10-25
	2-24	Silty clay, clay	CH	A-7	0	0	100	100	90-100	75-100	50-75	25-45
	24-80	Silty clay, silty clay loam, clay loam	CL, CH	A-6, A-7	0	0	100	100	85-100	60-100	25-75	11-45

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	<i>In</i>				<i>Pct</i>	<i>Pct</i>					<i>Pct</i>	
NeA:												
Niobell-----	0-12	Loam	CL, ML, CL-ML	A-4, A-6	0	0	95-100	95-100	85-95	60-75	25-38	3-15
	12-28	Clay loam, loam	CL, CH	A-6, A-7	0	0-1	95-100	95-100	90-100	70-80	30-60	15-35
	28-80	Loam, clay loam	ML, CL-ML, CL	A-4, A-6	0	0-1	95-100	95-100	85-95	60-75	25-40	3-18
Noonan-----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0-1	95-100	95-100	80-95	55-75	20-38	5-20
	8-18	Clay loam	CL, CH	A-6, A-7	0	0-1	95-100	95-100	85-95	65-85	25-60	10-35
	18-80	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-1	90-100	85-100	75-95	60-85	25-50	5-30
Max-----	0-14	Loam	ML, CL-ML, CL	A-4, A-6, A-7	0	0-3	95-100	90-100	85-95	60-75	25-45	3-23
	14-80	Loam, clay loam	CL-ML, CL, ML	A-4, A-6, A-7	0	0-3	95-100	90-100	85-100	60-80	25-45	3-23
Nm:												
Noonan-----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0-1	95-100	95-100	80-95	55-75	20-38	5-20
	8-18	Clay loam	CH, CL	A-6, A-7	0	0-1	95-100	95-100	85-95	65-85	25-60	10-35
	18-80	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-1	90-100	85-100	75-95	60-85	25-50	5-30
Miranda-----	0-3	Loam	CL	A-6	0	0	100	95-100	85-95	60-85	25-40	5-15
	3-13	Clay loam	CL, CH	A-7, A-6	0	0-2	95-100	95-100	85-100	70-80	30-50	15-30
	13-80	Clay loam, loam	CL, CL-ML	A-7, A-6	0	0-2	95-100	95-100	85-100	70-80	25-50	15-30
Nr:												
Northville-----	0-5	Silt loam	CL, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-45	7-20
	5-8	Silt loam, silty clay loam	CL, ML, MH, CH	A-7	0	0	100	100	90-100	85-100	40-70	15-35
	8-22	Silty clay, clay, silty clay loam	MH, ML	A-7	0	0	100	100	95-100	90-100	45-75	15-40
	22-58	Silty clay loam, silt loam, silty clay	CH, CL, MH, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-55	7-30
	58-80	Silty clay loam, clay loam, silty clay	CL, ML, MH, CH	A-4, A-6, A-7	0	0	100	100	95-100	85-100	30-55	7-30
Farmsworth-----	0-8	Silt loam	ML, CL	A-4, A-6	0	0	100	100	90-100	70-95	25-40	3-15
	8-25	Clay, silty clay, silty clay loam	CL, CH	A-7	0	0	100	100	85-100	80-95	40-70	15-40
	25-43	Clay, silty clay, silty clay loam	CL, CH	A-7	0	0	95-100	95-100	85-100	80-95	40-65	15-35
	43-80	Silty clay loam	SC, CL	A-6, A-7	0	0	95-100	95-100	70-100	35-55	30-45	12-27

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Nv:												
Northville-----	0-5	Silt loam	CL, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-45	7-20
	5-8	Silt loam, silty clay loam	CL, ML, MH, CH	A-7	0	0	100	100	90-100	85-100	40-70	15-35
	8-22	Silty clay, clay, silty clay loam	MH, ML	A-7	0	0	100	100	95-100	90-100	45-75	15-40
	22-58	Silty clay loam, silt loam, silty clay	ML, CH, CL, MH	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-55	7-30
	58-80	Silty clay loam, clay loam, silty clay	CH, CL, MH, ML	A-4, A-6, A-7	0	0	100	100	95-100	85-100	30-55	7-30
Farmsworth-----												
	0-8	Silt loam	ML, CL	A-4, A-6	0	0	100	100	90-100	70-95	25-40	3-15
	8-25	Clay, silty clay, silty clay loam	CL, CH	A-7	0	0	100	100	85-100	80-95	40-70	15-40
	25-43	Clay, silty clay, silty clay loam	CL, CH	A-7	0	0	95-100	95-100	85-100	80-95	40-65	15-35
	43-80	Silty clay loam	SC, CL	A-6, A-7	0	0	95-100	95-100	70-100	35-55	30-45	12-27
Hoven-----												
	0-3	Silt loam	ML, CL-ML, CL	A-4, A-6, A-7	0	0	100	100	90-100	75-95	27-45	5-20
	3-6	Silty clay, clay, clay loam	ML, MH, CL, CH	A-7	0	0	100	95-100	95-100	80-100	45-80	20-40
	6-22	Silty clay, clay, clay loam	CH, CL, MH, ML	A-7	0	0	100	95-100	95-100	80-100	45-80	20-40
	22-80	Silty clay, clay, silty clay loam	CL, CH	A-6, A-7	0	0	95-100	90-100	80-100	60-100	35-75	11-45
Ov:												
Overshue-----												
	0-7	Fine sandy loam	SM, ML, CL-ML, CL	A-2-4, A-4	0	0	100	100	60-85	30-55	0-30	NP-10
	7-42	Fine sandy loam, loamy fine sand, sandy loam	CL-ML, ML, SM	A-2, A-2-4, A-4	0	0	100	100	50-95	20-55	0-20	NP-10
	42-80	Loam, clay loam	ML, CL	A-4, A-6, A-7	0	0	95-100	95-100	85-95	50-85	30-45	5-20
Pa:												
Parnell-----												
	0-11	Silty clay loam	CL, CH	A-7	0	0	100	100	95-100	85-100	40-60	15-30
	11-41	Clay loam, silty clay loam, silty clay	CH, CL	A-7	0	0	100	95-100	90-100	70-100	40-80	20-50
	41-80	Clay loam, silty clay loam, silty clay	CH, CL	A-6, A-7	0	0	95-100	90-100	80-95	70-95	30-80	15-50

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Pc: Parshall-----	0-11	Loam	ML, CL	A-4	0	0	100	100	85-95	60-75	20-40	NP-10
	11-36	Fine sandy loam, sandy loam	SC, SM, CL-ML, ML	A-2, A-4	0	0	100	100	60-85	30-55	15-25	NP-10
	36-80	Fine sandy loam, sandy loam, loamy sand	CL-ML, ML, SC, SM	A-2, A-4	0	0	100	100	60-100	25-55	15-25	NP-10
PeA: Peever-----	0-7	Clay loam	CL	A-6, A-7	0	0	100	95-100	90-100	65-90	35-50	12-25
	7-15	Clay, silty clay, clay loam	ML, MH, CL, CH	A-7	0	0	100	95-100	85-100	70-85	40-65	15-30
	15-38	Clay loam, clay	CH, CL, ML, MH	A-7	0	0-5	95-100	90-100	85-100	70-85	40-65	15-30
	38-80	Clay loam, clay	MH, CH, ML, CL	A-7	0	0-5	95-100	90-100	85-100	70-85	40-65	15-30
PgB: Peever-----	0-7	Clay loam	CL	A-6, A-7	0	0	100	95-100	90-100	65-90	35-50	12-25
	7-15	Clay, silty clay, clay loam	CL, CH, ML, MH	A-7	0	0	100	95-100	85-100	70-85	40-65	15-30
	15-38	Clay loam, clay	CL, ML, MH, CH	A-7	0	0-5	95-100	90-100	85-100	70-85	40-65	15-30
	38-80	Clay loam, clay	CL, CH, ML, MH	A-7	0	0-5	95-100	90-100	85-100	70-85	40-65	15-30
Buse-----	0-7	Clay loam	CL, ML	A-6, A-7	0	0	90-100	85-95	70-95	55-90	35-45	10-20
	7-35	Loam, clay loam	ML, CL-ML, CL	A-4, A-6, A-7	0	0	90-100	85-100	70-90	55-85	25-45	5-20
	35-80	Loam, clay loam	ML, CL-ML, CL	A-4, A-6, A-7	0	0	90-100	85-100	70-90	55-85	25-45	5-20
PoA: Peever-----	0-7	Clay loam	CL	A-6, A-7	0	0	100	95-100	90-100	65-90	35-50	12-25
	7-15	Clay, silty clay, clay loam	MH, CH, CL, ML	A-7	0	0	100	95-100	85-100	70-85	40-65	15-30
	15-38	Clay loam, clay	CH, CL, MH, ML	A-7	0	0-5	95-100	90-100	85-100	70-85	40-65	15-30
	38-80	Clay loam, clay	CH, CL, MH, ML	A-7	0	0-5	95-100	90-100	85-100	70-85	40-65	15-30
Cavour-----	0-9	Loam	ML, CL	A-4, A-6, A-7-6	0	0	100	90-100	85-100	60-85	30-45	6-20
	9-22	Clay, clay loam, silty clay	CL, CH	A-6, A-7	0	0	100	90-100	85-100	60-85	30-55	10-35
	22-45	Clay loam, clay, loam	CH, CL	A-6, A-7	0	0	95-100	90-100	75-100	50-85	35-65	12-35
	45-80	Clay loam, loam	CL, CH	A-6, A-7	0	0-5	95-100	90-100	75-100	50-85	35-65	12-35

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Pp: Pits, gravel and sand-----	0-10	Gravelly loam	SM, GM	A-2, A-4	0	0-5	60-90	50-80	45-70	25-50	20-35	NP-7
	10-80	Gravelly loamy sand, gravelly sand, very gravelly sand	SM, SW, SW-SM	A-1	0	0-10	60-85	45-70	15-45	0-15	15-25	NP-5
Pr: Playmoor-----	0-9	Silty clay loam	ML, MH, CL, CH	A-6, A-7	0	0	100	100	95-100	80-100	35-60	12-25
	9-27	Silt loam, silty clay loam	ML, MH, CL, CH	A-6, A-7	0	0	100	100	90-100	80-100	35-60	12-25
	27-46	Silt loam, silty clay loam	ML, CL, CH, MH	A-6, A-7	0	0	100	100	95-100	85-100	35-60	12-25
	46-80	Stratified loamy sand to silt loam to silty clay loam	CH, CL, MH, ML	A-6, A-7	0	0	100	100	90-100	70-100	35-60	12-25
Py: Playmoor, channeled-----	0-9	Silty clay loam	CL, CH, ML, MH	A-6, A-7	0	0	100	100	95-100	80-100	35-60	12-25
	9-27	Silt loam, silty clay loam	ML, MH, CH, CL	A-6, A-7	0	0	100	100	90-100	80-100	35-60	12-25
	27-46	Silt loam, silty clay loam	ML, CH, CL, MH	A-6, A-7	0	0	100	100	95-100	85-100	35-60	12-25
	46-80	Stratified loamy sand to silt loam to silty clay loam	CH, CL, MH, ML	A-6, A-7	0	0	100	100	90-100	70-100	35-60	12-25
Lamoure, channeled-----	0-19	Silty clay loam	CH, CL, MH, ML	A-7	0	0	100	100	95-100	85-100	45-70	20-35
	19-38	Silty clay loam, silt loam	MH, ML, CL, CH	A-7	0	0	100	100	90-100	85-100	40-70	15-35
	38-55	Silty clay loam, silt loam, loam	ML, CL	A-6, A-7	0	0	95-100	95-100	90-100	75-100	30-50	10-20
	55-80	Stratified sandy loam to silty clay loam	SC, CL	A-6, A-7	0	0	95-100	95-100	70-95	35-90	30-50	10-25

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Ra: Ranslo-----	0-9	Silty clay loam	ML, MH, CL, CH	A-7	0	0	100	100	95-100	85-95	40-56	15-25
	9-25	Silty clay, silty clay loam, clay loam	CH, CL	A-7	0	0	100	100	95-100	75-90	40-60	20-35
	25-37	Clay loam, silty clay, silty clay loam	CH	A-7	0	0	100	100	95-100	75-95	50-75	23-42
	37-80	Clay loam, silty clay loam, sandy clay loam	CL, CH	A-6, A-7	0	0	100	100	85-100	50-90	35-55	12-28
Re: Ranslo-----	0-9	Loam	CL-ML, CL, ML	A-4, A-6	0	0	100	100	85-100	65-80	25-38	3-15
	9-25	Silty clay, silty clay loam, clay loam	CH, CL	A-7	0	0	100	100	95-100	75-90	40-60	20-35
	25-37	Clay loam, silty clay, silty clay loam	CH	A-7	0	0	100	100	95-100	75-95	50-75	23-42
	37-80	Clay loam, silty clay loam, sandy clay loam	CH, CL	A-6, A-7	0	0	100	100	85-100	50-90	35-55	12-28
Harriet-----	0-2	Loam	CL-ML, CL	A-4, A-6	0	0	100	100	85-95	60-80	25-45	5-20
	2-17	Clay loam, silty clay loam, silty clay	CH, CL	A-6, A-7	0	0	100	100	90-100	70-100	35-70	20-40
	17-42	Loam, silty clay loam, clay loam	CH, CL	A-6	0	0	100	100	90-100	60-100	25-55	10-30
	42-80	Stratified sandy loam to silty clay	CH, CL, CL-ML	A-4, A-6, A-7	0	0	100	100	90-100	60-100	20-65	5-40
RfA: Renshaw-----	0-7	Loam	ML, CL	A-4, A-6	0	0	95-100	90-100	70-100	50-75	30-40	5-15
	7-15	Loam, sandy clay loam, gravelly loam	SC-SM, CL, ML, SC	A-4, A-6	0	0-5	95-100	55-100	45-90	35-70	20-40	3-15
	15-80	Gravelly loamy sand, very gravelly loamy sand, coarse sand	GW-GM, SM, SW, SW-SM	A-1, A-2	0	0-5	45-95	30-80	10-60	0-15	0-25	NP-5
Fordville-----	0-8	Loam	ML, CL	A-4, A-6, A-7	0	0	100	100	70-85	55-75	30-45	5-20
	8-21	Loam, silt loam, clay loam	ML, CL	A-4, A-6, A-7	0	0	100	95-100	70-95	55-80	30-45	5-20
	21-33	Loam, clay loam, fine sandy loam	CL, ML, SC, SM	A-4, A-6	0	0	95-100	90-100	65-90	40-55	25-40	3-15
	33-80	Sand, gravelly sand, very gravelly sand	SW, SM, SW-SM	A-1	0	0	65-85	45-70	15-45	0-15	15-25	NP-5

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
RfB:												
Renshaw-----	0-7	Loam	ML, CL	A-4, A-6	0	0	95-100	90-100	70-100	50-75	30-40	5-15
	7-15	Loam, sandy clay loam, gravelly loam	CL, ML, SC, SC-SM	A-4, A-6	0	0-5	95-100	55-100	45-90	35-70	20-40	3-15
	15-80	Gravelly loamy sand, very gravelly loamy sand, coarse sand	GW-GM, SM, SW, SW-SM	A-1, A-2	0	0-5	45-95	30-80	10-60	0-15	0-25	NP-5
Fordville-----	0-8	Loam	CL, ML	A-4, A-6, A-7	0	0	100	100	70-85	55-75	30-45	5-20
	8-21	Loam, silt loam, clay loam	CL, ML	A-4, A-6, A-7	0	0	100	95-100	70-95	55-80	30-45	5-20
	21-33	Loam, clay loam, fine sandy loam	CL, ML, SC, SM	A-4, A-6	0	0	95-100	90-100	65-90	40-55	25-40	3-15
	33-80	Sand, gravelly sand, very gravelly sand	SM, SW-SM, SW	A-1	0	0	65-85	45-70	15-45	0-15	15-25	NP-5
So:												
Southam-----	0-7	Silty clay loam	OL, CL, CH	A-7	0	0	100	95-100	90-100	80-100	40-55	20-35
	7-51	Silty clay, clay, silty clay loam	CH, CL	A-7	0	0	100	95-100	90-100	85-100	50-65	30-40
	51-60	Silty clay, silty clay loam, loam	CH, CL-ML, CL	A-6, A-7	0	0-1	100	95-100	85-100	60-100	35-65	15-40
St:												
Stickney-----	0-10	Silt loam	ML, CL	A-4, A-6, A-7	0	0	95-100	95-100	85-100	85-95	30-50	8-20
	10-22	Clay loam, silty clay loam, clay	CH, CL, MH, ML	A-7	0	0	95-100	95-100	85-100	65-95	40-60	14-34
	22-80	Clay loam, loam	CH, CL, MH, ML	A-6, A-7	0	0-5	95-100	90-100	80-100	55-90	35-60	10-35
Dudley-----	0-7	Loam	ML, CL	A-6, A-7	0	0	95-100	95-100	90-100	70-90	35-45	10-20
	7-18	Clay loam, silty clay loam, clay	CL, CH	A-7	0	0	95-100	95-100	85-100	65-85	40-60	15-35
	18-39	Clay loam, clay, loam	CL, CH	A-6, A-7	0	0	95-100	95-100	85-100	65-85	35-60	15-35
	39-80	Clay loam, loam	CL, CH	A-6, A-7	0	0-5	95-100	90-100	80-100	55-80	30-60	11-35
Su:												
Stickney-----	0-10	Silt loam	CL, ML	A-4, A-6, A-7	0	0	95-100	95-100	85-100	85-95	30-50	8-20
	10-22	Clay loam, silty clay loam, clay	CH, CL, MH, ML	A-7	0	0	95-100	95-100	85-100	65-95	40-60	14-34
	22-80	Clay loam, loam	CL, ML, CH, MH	A-6, A-7	0	0-5	95-100	90-100	80-100	55-90	35-60	10-35

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Su: (cont.)												
Dudley-----	0-7	Loam	CL, ML	A-6, A-7	0	0	95-100	95-100	90-100	70-90	35-45	10-20
	7-18	Clay loam, silty clay loam, clay	CH, CL	A-7	0	0	95-100	95-100	85-100	65-85	40-60	15-35
	18-39	Clay loam, clay, loam	CL, CH	A-6, A-7	0	0	95-100	95-100	85-100	65-85	35-60	15-35
	39-80	Clay loam, loam	CL, CH	A-6, A-7	0	0-5	95-100	90-100	80-100	55-80	30-60	11-35
Hoven-----	0-3	Silt loam	CL, CL-ML, ML	A-4, A-6, A-7	0	0	100	100	90-100	75-95	27-45	5-20
	3-6	Silty clay, clay, clay loam	ML, CL, CH, MH	A-7	0	0	100	95-100	95-100	80-100	45-80	20-40
	6-22	Silty clay, clay, clay loam	ML, MH, CL, CH	A-7	0	0	100	95-100	95-100	80-100	45-80	20-40
	22-80	Silty clay, clay, silty clay loam	CL, CH	A-6, A-7	0	0	95-100	90-100	80-100	60-100	35-75	11-45
Sw:												
Straw,												
channeled-----	0-25	Loam	CL, CL-ML	A-4	0	0	95-100	90-100	85-100	60-90	20-30	5-10
	25-80	Loam, silt loam, clay loam	CL, CL-ML, SC, SM	A-2, A-4, A-6	0	0	90-100	80-100	60-100	25-60	15-40	3-20
Sx:												
Straw-----	0-25	Loam	CL-ML, CL	A-4	0	0	95-100	90-100	85-100	60-90	20-30	5-10
	25-80	Loam, silt loam, clay loam	SM, SC, CL, CL-ML	A-2, A-4, A-6	0	0	90-100	80-100	60-100	25-60	15-40	3-20
TbE:												
Talmo, stony----	0-7	Gravelly loam	SC, CL	A-4, A-6	0	0-5	90-100	65-90	35-90	25-80	28-34	9-14
	7-80	Extremely gravelly sand, very gravelly sand, very gravelly loamy sand	SW, GM, GW, SM	A-1, A-2	0	0-10	40-95	20-65	15-35	0-35	15-25	NP-5
Ethan, stony----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0-5	95-100	90-100	85-100	55-85	25-40	5-20
	8-20	Loam, clay loam	CL	A-6, A-7	0-3	0-5	95-100	90-100	80-100	55-80	30-50	10-25
	20-32	Loam, clay loam	CL	A-4, A-6, A-7	0-3	0-5	90-100	85-100	75-100	50-95	28-45	8-20
	32-60	Loam, clay loam	CL	A-4, A-6, A-7	0-3	0-5	90-100	85-100	75-100	50-95	28-45	8-20
Te:												
Tetonka-----	0-13	Silt loam	CL, ML	A-4, A-6, A-7	0	0	100	100	95-100	80-100	27-50	8-20
	13-39	Clay, silty clay, clay loam	CH, CL, MH, ML	A-7	0	0	95-100	95-100	85-100	65-100	40-70	15-35
	39-80	Clay loam, silty clay, clay	CH, CL	A-6, A-7	0	0	95-100	95-100	80-100	55-95	30-60	11-30

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Tk:												
Toko-----	0-8	Fine sandy loam	SC-SM, SM	A-4	0	0	100	100	60-85	35-50	15-30	NP-7
	8-11	Fine sandy loam, sandy loam, loamy sand	SM, SC-SM	A-2, A-4	0	0	100	95-100	55-85	25-45	15-30	NP-7
	11-28	Sandy clay loam, clay loam, sandy loam	SC-SM, SC, CL, CL-ML	A-4, A-6	0	0	100	95-100	70-100	40-70	20-45	5-20
	28-56	Sandy loam, loam, loamy sand	CL-ML, SC, SC-SM, CL	A-4	0	0	100	90-100	65-95	35-65	15-30	NP-10
	56-80	Clay loam, loam	CL-ML, ML, CL	A-4, A-6	0	0-5	95-100	95-100	80-100	55-75	20-40	3-20
Tm:												
Toko, wet-----	0-8	Fine sandy loam	SC-SM, SM	A-4	0	0	100	100	60-85	35-50	15-30	NP-7
	8-11	Fine sandy loam, sandy loam, loamy sand	SC-SM, SM	A-2, A-4	0	0	100	95-100	55-85	25-45	15-30	NP-7
	11-28	Sandy clay loam, clay loam, sandy loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	95-100	70-100	40-70	20-45	5-20
	28-56	Sandy loam, loam, loamy sand	CL-ML, SC, SC-SM, CL	A-4	0	0	100	90-100	65-95	35-65	15-30	NP-10
	56-80	Clay loam, loam	CL, CL-ML, ML	A-4, A-6	0	0-5	95-100	95-100	80-100	55-75	20-40	3-20
Tn:												
Tonka-----	0-16	Silt loam	CL-ML, CL	A-4, A-6	0-1	0-2	100	95-100	90-100	70-90	35-45	15-25
	16-41	Silty clay loam, clay loam, silty clay	CL, CH	A-6, A-7	0-1	0-2	100	95-100	90-100	75-95	50-60	30-40
	41-80	Silty clay loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0-1	0-3	90-100	85-100	60-100	50-90	35-55	15-30
To:												
Tonka-----	0-16	Silt loam	CL, CL-ML	A-4, A-6	0-1	0-2	100	95-100	90-100	70-90	35-45	15-25
	16-41	Silty clay loam, clay loam, silty clay	CH, CL	A-6, A-7	0-1	0-2	100	95-100	90-100	75-95	50-60	30-40
	41-80	Silty clay loam, clay loam	CL-ML, CL	A-4, A-6, A-7	0-1	0-3	90-100	85-100	60-100	50-90	35-55	15-30
Rimlap-----	0-10	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	70-90	25-40	5-15
	10-39	Clay, silty clay	CL, CH	A-7	0	0	100	100	90-100	75-95	45-65	30-45
	39-45	Clay, silty clay, clay loam	CH, CL	A-7	0	0	100	100	85-100	65-95	40-65	20-40
	45-80	Clay loam, silty clay loam, loam	CL-ML, CL	A-4, A-6	0	0-3	95-100	90-100	85-95	60-85	30-50	15-30

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Us:												
Udorthents, silty-----	0-8	Silt loam	CL-ML, ML, CL	A-4, A-6	0	0-5	95-100	90-100	70-95	60-90	20-40	5-15
	8-80	Silt loam, silty clay loam	CL-ML, CL	A-4, A-6	0	0-5	95-100	90-100	80-95	60-80	25-40	5-20
Va:												
Vallers-----	0-6	Loam	CL, ML	A-4	0	0	95-100	90-100	80-90	50-80	30-40	4-10
	6-30	Clay loam, silty clay loam, loam	CL	A-6	0	0	95-100	90-100	80-95	50-80	30-40	11-20
	30-80	Loam, clay loam	CL-ML, CL	A-4, A-6	0	0	95-100	90-100	85-95	60-85	20-40	5-20
Hamerly-----	0-9	Loam	CL-ML, CL	A-4, A-6	0	0-5	95-100	90-100	80-95	60-90	20-40	5-20
	9-29	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-75	20-45	5-25
	29-80	Loam, clay loam	CL-ML, CL	A-4, A-6, A-7	0	0-5	95-100	90-100	75-95	55-75	20-45	5-25
VgA:												
Vang-----	0-9	Loam	CL-ML, ML, CL	A-4, A-6, A-7	0	0	100	100	85-100	60-80	25-45	5-15
	9-29	Loam, clay loam, gravelly loam	CL, CL-ML, ML	A-4, A-6, A-7	0	0	65-100	50-100	40-100	35-80	25-45	5-15
	29-80	Very gravelly coarse sand, extremely gravelly sand, very gravelly loamy sand	GM, SM	A-1, A-2	0-5	5-25	50-95	30-75	15-60	15-30	0-14	NP
W:												
Water-----	---	---	---	---	---	---	---	---	---	---	---	---
WaA:												
Williams-----	0-7	Loam	ML, CL	A-4, A-6, A-7	0-2	0-5	95-100	95-100	85-95	60-90	25-45	3-20
	7-22	Clay loam, loam	CL	A-6, A-7	0-2	0-5	95-100	95-100	80-100	60-80	30-50	10-30
	22-80	Clay loam, loam	CL	A-6, A-7	0-2	0-5	95-100	95-100	80-100	60-80	30-50	10-30
Bowbells-----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0-5	95-100	90-100	85-95	60-90	20-38	5-15
	8-28	Loam, clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	80-95	60-80	30-45	10-20
	28-80	Loam, clay loam	CL	A-6, A-7	0-3	0-5	95-100	90-100	80-95	60-80	30-45	10-20
WaB:												
Williams-----	0-7	Loam	CL, ML	A-4, A-6, A-7	0-2	0-5	95-100	95-100	85-95	60-90	25-45	3-20
	7-22	Clay loam, loam	CL	A-6, A-7	0-2	0-5	95-100	95-100	80-100	60-80	30-50	10-30
	22-80	Clay loam, loam	CL	A-6, A-7	0-2	0-5	95-100	95-100	80-100	60-80	30-50	10-30
Bowbells-----	0-8	Loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	90-100	85-95	60-90	20-38	5-15
	8-28	Loam, clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	80-95	60-80	30-45	10-20
	28-80	Loam, clay loam	CL	A-6, A-7	0-3	0-5	95-100	90-100	80-95	60-80	30-45	10-20

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
WbA:												
Williams-----	0-7	Loam	CL, ML	A-4, A-6, A-7	0-2	0-5	95-100	95-100	85-95	60-90	25-45	3-20
	7-22	Clay loam, loam	CL	A-6, A-7	0-2	0-5	95-100	95-100	80-100	60-80	30-50	10-30
	22-80	Clay loam, loam	CL	A-6, A-7	0-2	0-5	95-100	95-100	80-100	60-80	30-50	10-30
Bowbells-----	0-8	Loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	90-100	85-95	60-90	20-38	5-15
	8-28	Loam, clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	80-95	60-80	30-45	10-20
	28-80	Loam, clay loam	CL	A-7, A-6	0-3	0-5	95-100	90-100	80-95	60-80	30-45	10-20
Tonka-----	0-16	Silt loam	CL, CL-ML	A-4, A-6	0-1	0-2	100	95-100	90-100	70-90	35-45	15-25
	16-41	Silty clay loam, clay loam, silty clay	CL, CH	A-6, A-7	0-1	0-2	100	95-100	90-100	75-95	50-60	30-40
	41-80	Silty clay loam, clay loam	CL-ML, CL	A-4, A-6, A-7	0-1	0-3	90-100	85-100	60-100	50-90	35-55	15-30
WbB:												
Williams-----	0-7	Loam	ML, CL	A-4, A-6, A-7	0-2	0-5	95-100	95-100	85-95	60-90	25-45	3-20
	7-22	Clay loam, loam	CL	A-6, A-7	0-2	0-5	95-100	95-100	80-100	60-80	30-50	10-30
	22-80	Clay loam, loam	CL	A-6, A-7	0-2	0-5	95-100	95-100	80-100	60-80	30-50	10-30
Bowbells-----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0-5	95-100	90-100	85-95	60-90	20-38	5-15
	8-28	Loam, clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	80-95	60-80	30-45	10-20
	28-80	Loam, clay loam	CL	A-6, A-7	0-3	0-5	95-100	90-100	80-95	60-80	30-45	10-20
Tonka-----	0-16	Silt loam	CL, CL-ML	A-4, A-6	0-1	0-2	100	95-100	90-100	70-90	35-45	15-25
	16-41	Silty clay loam, clay loam, silty clay	CH, CL	A-6, A-7	0-1	0-2	100	95-100	90-100	75-95	50-60	30-40
	41-80	Silty clay loam, clay loam	CL-ML, CL	A-4, A-6, A-7	0-1	0-3	90-100	85-100	60-100	50-90	35-55	15-30
WcA:												
Williams-----	0-7	Loam	CL, ML	A-4, A-6, A-7	0-2	0-5	95-100	95-100	85-95	60-90	25-45	3-20
	7-22	Clay loam, loam	CL	A-6, A-7	0-2	0-5	95-100	95-100	80-100	60-80	30-50	10-30
	22-80	Clay loam, loam	CL	A-6, A-7	0-2	0-5	95-100	95-100	80-100	60-80	30-50	10-30
Niobell-----	0-12	Loam	CL, ML, CL-ML	A-4, A-6	0	0	95-100	95-100	85-95	60-75	25-38	3-15
	12-28	Clay loam, loam	CH, CL	A-6, A-7	0	0-1	95-100	95-100	90-100	70-80	30-60	15-35
	28-80	Loam, clay loam	CL-ML, ML, CL	A-4, A-6	0	0-1	95-100	95-100	85-95	60-75	25-40	3-18
WcB:												
Williams-----	0-7	Loam	ML, CL	A-4, A-6, A-7	0-2	0-5	95-100	95-100	85-95	60-90	25-45	3-20
	7-22	Clay loam, loam	CL	A-6, A-7	0-2	0-5	95-100	95-100	80-100	60-80	30-50	10-30
	22-80	Clay loam, loam	CL	A-6, A-7	0-2	0-5	95-100	95-100	80-100	60-80	30-50	10-30

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
WcB: (cont.)												
Niobell-----	0-12	Loam	CL, CL-ML, ML	A-4, A-6	0	0	95-100	95-100	85-95	60-75	25-38	3-15
	12-28	Clay loam, loam	CH, CL	A-6, A-7	0	0-1	95-100	95-100	90-100	70-80	30-60	15-35
	28-80	Loam, clay loam	CL, CL-ML, ML	A-4, A-6	0	0-1	95-100	95-100	85-95	60-75	25-40	3-18
WdA:												
Williams-----	0-7	Loam	CL, ML	A-4, A-6, A-7	0-2	0-5	95-100	95-100	85-95	60-90	25-45	3-20
	7-22	Clay loam, loam	CL	A-6, A-7	0-2	0-5	95-100	95-100	80-100	60-80	30-50	10-30
	22-80	Clay loam, loam	CL	A-6, A-7	0-2	0-5	95-100	95-100	80-100	60-80	30-50	10-30
Niobell-----	0-12	Loam	CL-ML, ML, CL	A-4, A-6	0	0	95-100	95-100	85-95	60-75	25-38	3-15
	12-28	Clay loam, loam	CH, CL	A-6, A-7	0	0-1	95-100	95-100	90-100	70-80	30-60	15-35
	28-80	Loam, clay loam	CL-ML, ML, CL	A-4, A-6	0	0-1	95-100	95-100	85-95	60-75	25-40	3-18
Tonka-----	0-16	Silt loam	CL-ML, CL	A-4, A-6	0-1	0-2	100	95-100	90-100	70-90	35-45	15-25
	16-41	Silty clay loam, clay loam, silty clay	CL, CH	A-6, A-7	0-1	0-2	100	95-100	90-100	75-95	50-60	30-40
	41-80	Silty clay loam, clay loam	CL-ML, CL	A-4, A-6, A-7	0-1	0-3	90-100	85-100	60-100	50-90	35-55	15-30
WhD:												
Williams-----	0-7	Loam	CL, ML	A-6, A-7, A-4	0-2	0-5	95-100	95-100	85-95	60-90	25-45	3-20
	7-22	Clay loam, loam	CL	A-6, A-7	0-2	0-5	95-100	95-100	80-100	60-80	30-50	10-30
	22-80	Clay loam, loam	CL	A-6, A-7	0-2	0-5	95-100	95-100	80-100	60-80	30-50	10-30
Vida-----	0-3	Loam	CL-ML, CL	A-4, A-6	0	0-10	95-100	90-100	90-100	60-75	25-40	5-20
	3-9	Loam, clay loam	CL	A-6	0	0-5	95-100	90-100	85-100	60-80	30-40	11-20
	9-21	Loam, clay loam	CL	A-6	0	0-5	95-100	90-100	85-100	55-80	30-40	11-20
	21-80	Loam, clay loam	CL	A-4, A-6	0	0-5	95-100	90-100	85-100	50-80	25-40	7-20
WmB:												
Williams-----	0-7	Loam	CL, ML	A-4, A-6, A-7	0-2	0-5	95-100	95-100	85-95	60-90	25-45	3-20
	7-22	Clay loam, loam	CL	A-6, A-7	0-2	0-5	95-100	95-100	80-100	60-80	30-50	10-30
	22-80	Clay loam, loam	CL	A-6, A-7	0-2	0-5	95-100	95-100	80-100	60-80	30-50	10-30
Zahl-----	0-8	Loam	CL	A-6	0	0-1	95-100	95-100	80-95	55-75	25-40	10-20
	8-29	Loam, clay loam	CL-ML, CL	A-4, A-6, A-7	0	0-1	90-100	85-100	80-95	55-80	25-50	5-30
	29-80	Clay loam, loam	CL, CL-ML	A-4, A-6, A-7	0	0-1	90-100	85-100	80-95	55-80	25-50	5-30
Bowbells-----	0-8	Loam	CL-ML, CL	A-4, A-6	0	0-5	95-100	90-100	85-95	60-90	20-38	5-15
	8-28	Loam, clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	80-95	60-80	30-45	10-20
	28-80	Loam, clay loam	CL	A-6, A-7	0-3	0-5	95-100	90-100	80-95	60-80	30-45	10-20

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
WmC:												
Williams-----	0-7	Loam	ML, CL	A-4, A-6, A-7	0-2	0-5	95-100	95-100	85-95	60-90	25-45	3-20
	7-22	Clay loam, loam	CL	A-6, A-7	0-2	0-5	95-100	95-100	80-100	60-80	30-50	10-30
	22-80	Clay loam, loam	CL	A-6, A-7	0-2	0-5	95-100	95-100	80-100	60-80	30-50	10-30
Zahl-----	0-8	Loam	CL	A-6	0	0-1	95-100	95-100	80-95	55-75	25-40	10-20
	8-29	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-1	90-100	85-100	80-95	55-80	25-50	5-30
	29-80	Clay loam, loam	CL, CL-ML	A-4, A-6, A-7	0	0-1	90-100	85-100	80-95	55-80	25-50	5-30
Bowbells-----	0-8	Loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	90-100	85-95	60-90	20-38	5-15
	8-28	Loam, clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	80-95	60-80	30-45	10-20
	28-80	Loam, clay loam	CL	A-6, A-7	0-3	0-5	95-100	90-100	80-95	60-80	30-45	10-20
Wn:												
Winship-----	0-25	Silt loam	CL, ML	A-6, A-7, A-4	0	0	100	100	90-100	85-100	30-45	7-20
	25-57	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	90-100	85-100	35-50	15-25
	57-80	Silt loam, silty clay loam	CL	A-6, A-7	0	0	100	100	90-100	85-100	30-50	10-25
Tonka-----	0-16	Silt loam	CL, CL-ML	A-4, A-6	0-1	0-2	100	95-100	90-100	70-90	35-45	15-25
	16-41	Silty clay loam, clay loam, silty clay	CL, CH	A-6, A-7	0-1	0-2	100	95-100	90-100	75-95	50-60	30-40
	41-80	Silty clay loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0-1	0-3	90-100	85-100	60-100	50-90	35-55	15-30
Wo:												
Winship-----	0-18	Silt loam	ML, CL	A-4, A-6, A-7	0	0	100	100	90-100	85-100	30-45	7-20
	18-41	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	90-100	85-100	35-50	15-25
	41-57	Silt loam, silty clay loam	CL	A-6, A-7	0	0	100	100	90-100	85-100	30-50	10-25
	57-80	Clay loam, loam	CL	A-6, A-7	0-5	0-5	95-100	90-100	80-100	65-85	30-50	10-30
Tonka-----	0-16	Silt loam	CL-ML, CL	A-4, A-6	0-1	0-2	100	95-100	90-100	70-90	35-45	15-25
	16-41	Silty clay loam, clay loam, silty clay	CH, CL	A-6, A-7	0-1	0-2	100	95-100	90-100	75-95	50-60	30-40
	41-80	Silty clay loam, clay loam	CL-ML, CL	A-4, A-6, A-7	0-1	0-3	90-100	85-100	60-100	50-90	35-55	15-30
Ws:												
Woonsocket-----	0-9	Fine sandy loam	SM, ML	A-2, A-4	0	0	100	95-100	60-80	30-55	20-30	NP-7
	9-25	Sandy clay loam, sandy loam, fine sandy loam	SC, SC-SM	A-4, A-6	0	0	100	100	65-90	35-50	25-35	5-15
	25-80	Loamy fine sand, loamy sand, fine sandy loam	SC-SM, SP-SM, SM	A-2, A-3	0	0	100	95-100	50-85	5-30	0-25	NP-5

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Ws:(cont.) Whitelake-----	0-8	Fine sandy loam	ML, SC-SM, SM, CL-ML	A-2, A-4	0	0	100	100	70-100	30-55	15-25	NP-5
	8-12	Fine sandy loam, sandy loam, loamy fine sand	SM, SC-SM	A-2, A-4	0	0	100	100	70-100	30-50	15-25	NP-5
	12-21	Sandy clay loam, fine sandy loam	SC-SM, CL-ML, CL, SC	A-4, A-6	0	0	100	100	60-100	35-55	25-40	6-20
	21-80	Stratified sand to sandy loam to silt loam	SC-SM, CL-ML, ML, CL	A-2, A-4, A-6	0	0	100	95-100	60-100	20-65	15-35	NP-12
Wt: Worthing-----	0-10	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	85-100	40-60	15-30
	10-45	Silty clay, clay	CH, MH	A-7	0	0	100	100	95-100	85-100	50-70	22-35
	45-60	Silty clay, silty clay loam, clay loam	CH, CL, MH, ML	A-7	0	0	100	95-100	90-100	70-100	40-65	15-30
Ww: Worthing, ponded	0-10	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	85-100	40-60	15-30
	10-45	Silty clay, clay	MH, CH	A-7	0	0	100	100	95-100	85-100	50-70	22-35
	45-60	Silty clay, silty clay loam, clay loam	CH, MH, CL, ML	A-7	0	0	100	95-100	90-100	70-100	40-65	15-30
ZaE: Zahill-----	0-3	Loam	CL	A-4, A-6	0	0-10	90-100	90-100	85-95	60-75	25-35	7-15
	3-18	Loam, clay loam	CL	A-4, A-6	0	0-5	90-100	90-100	85-100	60-80	25-40	7-20
	18-80	Loam, clay loam	CL	A-4, A-6	0	0-5	90-100	90-100	85-100	60-80	25-40	7-20
ZbC: Zahl-----	0-8	Loam	CL	A-6	0	0-1	95-100	95-100	80-95	55-75	25-40	10-20
	8-29	Loam, clay loam	CL-ML, CL	A-4, A-6, A-7	0	0-1	90-100	85-100	80-95	55-80	25-50	5-30
	29-80	Clay loam, loam	CL, CL-ML	A-4, A-6, A-7	0	0-1	90-100	85-100	80-95	55-80	25-50	5-30
Max-----	0-14	Loam	CL, ML, CL-ML	A-4, A-6, A-7	0	0-3	95-100	90-100	85-95	60-75	25-45	3-23
	14-80	Loam, clay loam	ML, CL, CL-ML	A-4, A-6, A-7	0	0-3	95-100	90-100	85-100	60-80	25-45	3-23
ZbD: Zahl-----	0-8	Loam	CL	A-6	0	0-1	95-100	95-100	80-95	55-75	25-40	10-20
	8-29	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-1	90-100	85-100	80-95	55-80	25-50	5-30
	29-80	Clay loam, loam	CL-ML, CL	A-4, A-6, A-7	0	0-1	90-100	85-100	80-95	55-80	25-50	5-30
Max-----	0-14	Loam	ML, CL-ML, CL	A-4, A-6, A-7	0	0-3	95-100	90-100	85-95	60-75	25-45	3-23
	14-80	Loam, clay loam	CL, ML, CL-ML	A-4, A-6, A-7	0	0-3	95-100	90-100	85-100	60-80	25-45	3-23

Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	<i>In</i>				<i>Pct</i>	<i>Pct</i>					<i>Pct</i>	
ZgD: Zell-----	0-7	Silt loam	ML, CL	A-4, A-6	0	0	100	95-100	90-100	80-100	30-40	5-15
	7-31	Silt loam, very fine sandy loam, loam	CL-ML, CL	A-4, A-6	0	0	100	95-100	85-100	70-100	25-40	5-15
	31-80	Silt loam, very fine sandy loam, loam	CL-ML, ML	A-4	0	0	100	95-100	85-100	60-100	15-25	NP-7
Great Bend-----	0-7	Silt loam	ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-45	5-20
	7-12	Silt loam, silty clay loam	ML, CL	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	12-32	Silt loam, silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	32-53	Stratified silt loam to silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	53-80	Stratified very fine sand to silt loam to clay	CL, CL-ML, ML	A-4, A-6, A-7	0	0	100	100	95-100	85-100	25-50	3-25

Physical Properties of the Soils

(The symbol < means less than; > means greater than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Dashes (--) indicate that data were not available or were not estimated.)

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
Aa:												
Aastad-----	0-14	24-27	1.35-1.45	0.6-2	0.18-0.20	Moderate	4.0-6.0	.24	.24	5	6	48
	14-29	28-35	1.45-1.60	0.2-0.6	0.15-0.19	Moderate	2.0-5.0	.28	.28			
	29-80	24-35	1.55-1.65	0.2-0.6	0.14-0.16	Moderate	0.0-0.5	.37	.37			
Ab:												
Aastad-----	0-14	24-27	1.35-1.45	0.6-2	0.18-0.20	Moderate	4.0-6.0	.24	.24	5	6	48
	14-29	28-35	1.45-1.60	0.2-0.6	0.15-0.19	Moderate	2.0-5.0	.28	.28			
	29-80	24-35	1.55-1.65	0.2-0.6	0.14-0.16	Moderate	0.0-0.5	.37	.37			
Hamerly-----	0-9	18-27	1.30-1.60	0.6-2	0.18-0.24	Moderate	3.0-4.0	.24	.24	5	4L	86
	9-29	18-35	1.20-1.60	0.6-2	0.15-0.19	Moderate	1.0-3.0	.28	.28			
	29-80	18-35	1.30-1.60	0.2-0.6	0.14-0.19	Moderate	0.0-0.5	.37	.37			
Ad:												
Aastad-----	0-14	24-27	1.35-1.45	0.6-2	0.18-0.20	Moderate	4.0-6.0	.24	.24	5	6	48
	14-29	28-35	1.45-1.60	0.2-0.6	0.15-0.19	Moderate	2.0-5.0	.28	.28			
	29-80	24-35	1.55-1.65	0.2-0.6	0.14-0.16	Moderate	0.0-0.5	.37	.37			
Tonka-----	0-16	18-27	1.10-1.30	0.6-2	0.20-0.24	Low	5.0-10	.37	.37	5	6	48
	16-41	35-50	1.40-1.65	0.06-0.2	0.14-0.20	High	1.0-3.0	.43	.43			
	41-80	27-39	1.40-1.70	0.2-2	0.14-0.19	Moderate	0.0-1.0	.37	.37			
Ae:												
Aberdeen-----	0-11	20-26	1.10-1.25	0.6-2	0.19-0.22	Moderate	3.0-4.0	.37	.37	5	6	48
	11-23	35-55	1.20-1.35	0.06-0.2	0.13-0.18	High	1.0-4.0	.37	.37			
	23-36	30-55	1.20-1.35	0.06-0.2	0.14-0.17	High	1.0-4.0	.37	.37			
	36-49	10-30	1.25-1.40	0.06-2	0.14-0.17	Moderate	0.0-1.0	.43	.43			
	49-80	25-30	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
Nahon-----	0-7	23-26	1.20-1.30	0.2-0.6	0.19-0.22	Low	2.0-5.0	.37	.37	2	6	48
	7-9	20-30	1.20-1.35	0.2-0.6	0.19-0.22	Moderate	1.0-2.0	.37	.37			
	9-21	35-55	1.25-1.45	0.01-0.06	0.10-0.15	High	1.0-3.0	.37	.37			
	21-43	23-55	1.20-1.35	0.06-0.2	0.11-0.19	High	0.0-1.0	.37	.37			
	43-49	30-60	1.20-1.40	0.06-0.6	0.14-0.17	Moderate	0.0-0.5	.43	.43			
	49-80	25-30	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
Ah:												
Aberdeen-----	0-13	27-33	1.15-1.25	0.2-0.6	0.19-0.22	Moderate	3.0-4.0	.37	.37	5	7	38
	13-23	35-55	1.20-1.35	0.06-0.2	0.13-0.18	High	1.0-4.0	.37	.37			
	23-39	30-55	1.20-1.35	0.06-0.2	0.14-0.17	High	0.0-2.0	.37	.37			
	39-80	10-26	1.25-1.40	0.06-2	0.14-0.17	Low	0.0-1.0	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
Ah: (cont.)												
Nahon-----	0-7	23-26	1.20-1.30	0.2-0.6	0.19-0.22	Low	2.0-5.0	.37	.37	2	7	38
	7-9	20-30	1.20-1.35	0.2-0.6	0.19-0.22	Moderate	1.0-2.0	.37	.37			
	9-21	35-55	1.25-1.45	0.01-0.06	0.10-0.15	High	1.0-3.0	.37	.37			
	21-43	23-55	1.20-1.35	0.06-0.2	0.11-0.19	High	0.0-1.0	.37	.37			
	43-49	30-60	1.20-1.40	0.06-0.6	0.14-0.17	Moderate	0.0-0.5	.43	.43			
	49-80	25-30	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
An:												
Aberdeen-----	0-13	20-33	1.15-1.25	0.2-0.6	0.19-0.22	Moderate	3.0-4.0	.37	.37	5	6	48
	13-23	35-55	1.20-1.35	0.06-0.2	0.13-0.18	High	1.0-4.0	.37	.37			
	23-39	30-55	1.20-1.35	0.06-0.2	0.14-0.17	High	0.0-2.0	.37	.37			
	39-80	10-26	1.25-1.40	0.06-2	0.14-0.17	Low	0.0-1.0	.43	.43			
Nahon-----	0-7	23-26	1.20-1.30	0.2-0.6	0.19-0.22	Low	2.0-5.0	.37	.37	2	6	48
	7-9	20-30	1.20-1.35	0.2-0.6	0.19-0.22	Moderate	1.0-2.0	.37	.37			
	9-21	35-55	1.25-1.45	0.01-0.06	0.10-0.15	High	1.0-3.0	.37	.37			
	21-43	23-55	1.20-1.35	0.06-0.2	0.11-0.19	High	0.0-1.0	.37	.37			
	43-49	30-60	1.20-1.40	0.06-0.6	0.14-0.17	Moderate	0.0-0.5	.43	.43			
	49-80	25-30	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
Heil-----	0-2	18-27	1.20-1.40	0.6-2	0.15-0.24	Moderate	3.0-6.0	.37	.37	2	6	48
	2-24	45-60	1.20-1.55	0.01-0.06	0.13-0.18	High	0.0-1.0	.37	.37			
	24-80	27-50	1.20-1.70	0.06-0.2	0.13-0.18	High	0.0-0.5	.32	.32			
Ao:												
Aberdeen-----	0-11	20-26	1.10-1.25	0.6-2	0.19-0.22	Moderate	3.0-4.0	.37	.37	5	6	48
	11-23	35-55	1.20-1.35	0.06-0.2	0.13-0.18	High	1.0-4.0	.37	.37			
	23-36	30-55	1.20-1.35	0.06-0.2	0.14-0.17	High	1.0-4.0	.37	.37			
	36-49	10-30	1.25-1.40	0.06-2	0.14-0.17	Moderate	0.0-1.0	.43	.43			
	49-80	25-30	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
Nahon-----	0-7	23-26	1.20-1.30	0.2-0.6	0.19-0.22	Low	2.0-5.0	.37	.37	2	6	48
	7-9	20-30	1.20-1.35	0.2-0.6	0.19-0.22	Moderate	1.0-2.0	.37	.37			
	9-21	35-55	1.25-1.45	0.01-0.06	0.10-0.15	High	1.0-3.0	.37	.37			
	21-43	23-55	1.20-1.35	0.06-0.2	0.11-0.19	High	0.0-1.0	.37	.37			
	43-49	30-60	1.20-1.40	0.06-0.6	0.14-0.17	Moderate	0.0-0.5	.43	.43			
	49-80	25-30	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
Heil-----	0-2	18-27	1.20-1.40	0.6-2	0.15-0.24	Moderate	3.0-6.0	.37	.37	2	6	48
	2-24	45-60	1.20-1.55	0.01-0.06	0.13-0.18	High	0.0-1.0	.37	.37			
	24-47	27-50	1.20-1.70	0.06-0.2	0.13-0.18	High	0.0-0.5	.32	.32			
	47-80	27-50	1.20-1.70	0.06-0.2	0.13-0.18	High	0.0-0.5	.32	.32			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
At:												
Aquents, loamy-----	0-10	18-27	1.10-1.40	0.6-2	0.17-0.19	Moderate	0.0-2.0	.32	.32	5	4L	86
	10-80	18-27	1.20-1.35	0.06-2	0.14-0.20	Moderate	0.0-0.5	.28	.28			
BaC:												
Beadle-----	0-7	20-26	1.10-1.30	0.6-2	0.17-0.19	Low	2.0-4.0	.28	.28	5	6	48
	7-26	35-45	1.30-1.45	0.06-0.6	0.13-0.16	High	0.5-2.0	.32	.32			
	26-80	27-45	1.50-1.70	0.2-0.6	0.13-0.17	High	0.0-1.0	.37	.37			
BdA:												
Beadle-----	0-7	20-26	1.10-1.30	0.6-2	0.17-0.19	Low	2.0-4.0	.28	.28	5	6	48
	7-26	35-45	1.30-1.45	0.06-0.6	0.13-0.16	High	0.5-2.0	.32	.32			
	26-80	27-45	1.50-1.70	0.2-0.6	0.13-0.17	High	0.0-1.0	.37	.37			
Dudley-----	0-7	18-25	1.00-1.20	0.6-2	0.18-0.22	Low	2.0-4.0	.37	.37	2	6	48
	7-18	35-50	1.35-1.45	0.001-0.06	0.10-0.14	High	1.0-3.0	.32	.32			
	18-39	30-50	1.40-1.50	0.06-0.2	0.10-0.14	High	0.5-2.0	.32	.32			
	39-80	20-35	1.55-1.65	0.06-0.6	0.11-0.15	Moderate	0.0-0.5	.37	.37			
BeA:												
Beadle-----	0-7	20-26	1.10-1.30	0.6-2	0.17-0.19	Low	2.0-4.0	.28	.28	5	6	48
	7-26	35-45	1.30-1.45	0.06-0.6	0.13-0.16	High	0.5-2.0	.32	.32			
	26-80	27-45	1.50-1.70	0.2-0.6	0.13-0.17	High	0.0-1.0	.37	.37			
Stickney-----	0-10	20-27	1.15-1.30	0.6-2	0.20-0.22	Low	2.0-4.0	.37	.37	5	6	48
	10-22	35-45	1.20-1.35	0.06-0.2	0.16-0.19	High	0.0-2.0	.37	.37			
	22-80	20-35	1.50-1.70	0.06-0.6	0.14-0.18	Moderate	0.0-1.0	.37	.37			
BeB:												
Beadle-----	0-7	20-26	1.10-1.30	0.6-2	0.17-0.19	Low	2.0-4.0	.28	.28	5	6	48
	7-26	35-45	1.30-1.45	0.06-0.6	0.13-0.16	High	0.5-2.0	.32	.32			
	26-80	27-45	1.50-1.70	0.2-0.6	0.13-0.17	High	0.0-1.0	.37	.37			
Stickney-----	0-10	20-27	1.15-1.30	0.6-2	0.20-0.22	Low	2.0-4.0	.37	.37	5	6	48
	10-22	35-45	1.20-1.35	0.06-0.2	0.16-0.19	High	0.0-2.0	.37	.37			
	22-80	20-35	1.50-1.70	0.06-0.6	0.14-0.18	Moderate	0.0-1.0	.37	.37			
BfA:												
Beadle, stony-----	0-7	20-26	1.10-1.30	0.6-2	0.18-0.20	Low	2.0-4.0	.28	.28	5	8	0
	7-26	35-45	1.30-1.45	0.06-0.6	0.13-0.16	High	0.5-2.0	.32	.32			
	26-80	27-45	1.50-1.70	0.2-0.6	0.13-0.17	High	0.0-1.0	.37	.37			
Stickney, stony-----	0-10	20-27	1.15-1.30	0.6-2	0.20-0.22	Low	2.0-4.0	.37	.37	5	8	0
	10-22	35-45	1.20-1.35	0.06-0.2	0.16-0.19	High	0.0-2.0	.37	.37			
	22-80	20-35	1.50-1.70	0.06-0.6	0.14-0.18	Moderate	0.0-1.0	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
BfB:												
Beadle, stony-----	0-7	20-26	1.10-1.30	0.6-2	0.17-0.19	Low	2.0-4.0	.28	.28	5	8	0
	7-26	35-45	1.30-1.45	0.06-0.6	0.13-0.16	High	0.5-2.0	.32	.32			
	26-80	27-45	1.50-1.70	0.2-0.6	0.13-0.17	High	0.0-1.0	.37	.37			
Stickney, stony-----	0-10	20-27	1.15-1.30	0.6-2	0.20-0.22	Low	2.0-4.0	.37	.37	5	8	0
	10-22	35-45	1.20-1.35	0.06-0.2	0.16-0.19	High	0.0-2.0	.37	.37			
	22-80	20-35	1.50-1.70	0.06-0.6	0.14-0.18	Moderate	0.0-1.0	.37	.37			
Bg:												
Bearden-----	0-7	18-26	1.15-1.30	0.6-2	0.20-0.24	Moderate	3.0-4.0	.28	.28	5	4L	86
	7-16	18-34	1.30-1.35	0.2-2	0.16-0.22	Moderate	0.0-3.0	.43	.43			
	16-38	18-34	1.30-1.50	0.2-2	0.13-0.22	Moderate	0.0-1.0	.43	.43			
	38-80	15-59	1.30-1.55	0.06-2	0.13-0.22	Moderate	0.0-1.0	.43	.43			
Bk:												
Bearden-----	0-7	18-26	1.15-1.30	0.6-2	0.20-0.24	Moderate	3.0-4.0	.28	.28	5	4L	86
	7-16	18-34	1.30-1.35	0.2-2	0.16-0.22	Moderate	0.0-3.0	.43	.43			
	16-38	18-34	1.30-1.50	0.2-2	0.13-0.22	Moderate	0.0-1.0	.43	.43			
	38-80	15-59	1.30-1.55	0.06-2	0.13-0.22	Moderate	0.0-1.0	.43	.43			
Tonka-----	0-16	18-27	1.10-1.30	0.6-2	0.20-0.24	Low	5.0-10	.37	.37	5	6	48
	16-41	35-50	1.40-1.65	0.06-0.2	0.14-0.20	High	1.0-3.0	.43	.43			
	41-80	27-39	1.40-1.70	0.2-2	0.14-0.19	Moderate	0.0-1.0	.37	.37			
Bo:												
Beotia-----	0-9	20-27	1.10-1.25	0.6-2	0.19-0.22	Low	4.0-8.0	.28	.28	5	6	48
	9-21	18-30	1.15-1.30	0.6-2	0.19-0.22	Moderate	2.0-4.0	.32	.32			
	21-39	18-30	1.20-1.35	0.2-2	0.17-0.20	Moderate	0.5-2.0	.37	.37			
	39-80	18-35	1.20-1.35	0.06-2	0.17-0.20	Moderate	0.0-0.5	.43	.43			
Br:												
Beotia-----	0-9	20-27	1.10-1.25	0.6-2	0.19-0.22	Low	4.0-8.0	.28	.28	5	6	48
	9-21	18-30	1.15-1.30	0.6-2	0.19-0.22	Moderate	2.0-4.0	.32	.32			
	21-39	18-30	1.20-1.35	0.2-2	0.17-0.20	Moderate	0.5-2.0	.37	.37			
	39-80	18-35	1.20-1.35	0.06-2	0.17-0.20	Moderate	0.0-0.5	.43	.43			
Rondell-----	0-11	18-26	1.10-1.25	0.6-2	0.19-0.22	Moderate	3.0-4.0	.28	.28	5	4L	86
	11-36	19-34	1.15-1.30	0.6-2	0.14-0.17	Moderate	0.5-2.0	.43	.43			
	36-80	19-30	1.20-1.40	0.06-2	0.14-0.17	Low	0.0-0.5	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
Bs:												
Beotia-----	0-9	20-27	1.10-1.25	0.6-2	0.19-0.22	Low	4.0-8.0	.28	.28	5	6	48
	9-21	18-30	1.15-1.30	0.6-2	0.19-0.22	Moderate	2.0-4.0	.32	.32			
	21-39	18-30	1.20-1.35	0.2-2	0.17-0.20	Moderate	0.5-2.0	.37	.37			
	39-80	18-35	1.20-1.35	0.06-2	0.17-0.20	Moderate	0.0-0.5	.43	.43			
Winship-----	0-25	18-26	1.15-1.30	0.6-2	0.19-0.22	Low	4.0-6.0	.37	.37	5	6	48
	25-57	26-34	1.20-1.25	0.2-0.6	0.19-0.22	Moderate	0.0-3.0	.37	.37			
	57-80	24-30	1.20-1.35	0.06-0.6	0.17-0.20	Moderate	0.0-1.0	.43	.43			
Bt:												
Beotia-----	0-12	20-27	1.10-1.25	0.6-2	0.19-0.22	Low	4.0-8.0	.28	.28	5	6	48
	12-27	18-30	1.15-1.30	0.6-2	0.19-0.22	Moderate	2.0-4.0	.32	.32			
	27-46	18-30	1.20-1.35	0.2-2	0.17-0.20	Moderate	1.0-3.0	.37	.37			
	46-52	18-35	1.20-1.35	0.06-2	0.17-0.20	Moderate	0.0-0.5	.43	.43			
	52-80	25-30	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
Winship-----	0-18	18-26	1.15-1.30	0.6-2	0.19-0.22	Low	4.0-6.0	.37	.37	5	6	48
	18-41	26-34	1.20-1.25	0.2-0.6	0.19-0.22	Moderate	0.0-3.0	.37	.37			
	41-57	24-30	1.20-1.35	0.06-0.6	0.17-0.20	Moderate	0.0-1.0	.43	.43			
	57-80	25-30	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
Bu:												
Bon-----	0-26	20-27	1.20-1.30	0.6-2	0.19-0.22	Low	4.0-6.0	.24	.24	5	6	48
	26-49	15-30	1.25-1.40	0.6-2	0.13-0.17	Low	2.0-4.0	.32	.32			
	49-80	10-30	1.25-1.40	0.6-6	0.11-0.16	Low	0.0-1.0	.32	.32			
Bw:												
Bon, channeled-----	0-26	20-27	1.20-1.30	0.6-2	0.19-0.22	Low	4.0-6.0	.24	.24	5	6	48
	26-49	15-30	1.25-1.40	0.6-2	0.13-0.17	Low	2.0-4.0	.32	.32			
	49-80	10-30	1.25-1.40	0.6-6	0.11-0.16	Low	0.0-1.0	.32	.32			
BxD:												
Buse-----	0-7	18-27	1.40-1.50	0.2-0.6	0.17-0.22	Low	1.0-3.0	.28	.28	5	4L	86
	7-35	18-35	1.55-1.65	0.2-0.6	0.14-0.19	Moderate	0.5-1.0	.37	.37			
	35-80	18-35	1.55-1.65	0.2-0.6	0.14-0.19	Moderate	0.0-0.5	.37	.37			
Barnes-----	0-7	15-27	1.10-1.50	0.6-2	0.20-0.22	Low	3.0-6.0	.24	.24	5	6	48
	7-15	18-35	1.20-1.60	0.6-2	0.15-0.19	Moderate	2.0-5.0	.28	.28			
	15-38	18-35	1.30-1.60	0.2-2	0.14-0.19	Moderate	0.0-1.0	.37	.37			
	38-80	18-35	1.30-1.60	0.2-2	0.14-0.19	Moderate	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
ByE:												
Buse, stony-----	0-7	20-27	1.40-1.50	0.6-2	0.18-0.20	Moderate	2.0-4.0	.20	.28	5	8	0
	7-35	20-30	1.55-1.65	0.2-0.6	0.16-0.20	Moderate	0.5-1.0	.28	.28			
	35-80	20-30	1.55-1.65	0.2-0.6	0.16-0.20	Moderate	0.0-0.5	.28	.28			
Barnes, stony-----	0-7	18-26	1.20-1.60	0.6-2	0.20-0.22	Low	3.0-4.0	.17	.24	5	8	0
	7-15	18-35	1.20-1.60	0.6-2	0.15-0.19	Low	0.5-3.0	.28	.28			
	15-80	18-35	1.30-1.60	0.2-0.6	0.14-0.19	Low	0.0-1.0	.37	.37			
BzE:												
Buse-----	0-7	18-27	1.40-1.50	0.2-0.6	0.17-0.22	Low	1.0-3.0	.28	.28	5	4L	86
	7-35	18-35	1.55-1.65	0.2-0.6	0.14-0.19	Moderate	0.5-1.0	.37	.37			
	35-80	18-35	1.55-1.65	0.2-0.6	0.14-0.19	Moderate	0.0-0.5	.37	.37			
Langhei-----	0-4	28-35	1.40-1.50	0.2-0.6	0.17-0.22	Low	0.5-3.0	.28	.32	5	4L	86
	4-15	20-35	1.50-1.65	0.2-0.6	0.14-0.19	Low	0.0-0.5	.32	.37			
	15-80	20-35	1.50-1.65	0.2-0.6	0.14-0.19	Low	0.0-0.5	.32	.37			
Ca:												
Camtown-----	0-14	10-18	1.10-1.25	0.6-2	0.18-0.20	Low	3.0-4.0	.32	.32	5	5	56
	14-19	5-20	1.20-1.35	0.6-2	0.14-0.19	Low	1.0-4.0	.32	.32			
	19-36	18-30	1.25-1.50	0.06-0.2	0.14-0.18	Moderate	0.5-3.0	.32	.32			
	36-48	10-30	1.25-1.45	0.06-0.6	0.13-0.19	Moderate	0.0-1.0	.37	.37			
	48-80	5-25	1.20-1.45	0.06-2	0.13-0.20	Low	0.0-0.5	.43	.43			
Turton-----	0-8	10-18	1.10-1.25	0.6-2	0.18-0.20	Low	3.0-4.0	.32	.32	2	5	56
	8-10	5-15	1.25-1.40	0.6-2	0.15-0.18	Low	1.0-3.0	.24	.24			
	10-24	18-30	1.25-1.50	0.06-0.2	0.13-0.17	Moderate	0.0-1.0	.37	.37			
	24-38	10-28	1.25-1.45	0.06-0.6	0.12-0.18	Moderate	0.0-0.5	.37	.37			
	38-80	5-25	1.20-1.45	0.06-2	0.12-0.20	Low	0.0-0.5	.43	.43			
Cf:												
Cavour-----	0-9	18-25	1.10-1.25	0.6-2	0.18-0.20	Low	2.0-4.0	.32	.32	2	6	48
	9-22	35-50	1.25-1.40	0.001-0.06	0.10-0.16	High	1.0-4.0	.28	.28			
	22-45	25-50	1.25-1.50	0.06-0.2	0.10-0.16	High	0.0-1.0	.37	.37			
	45-80	25-35	1.50-1.75	0.06-0.6	0.11-0.15	Moderate	0.0-0.5	.37	.37			
Ferney-----	0-3	18-26	1.15-1.30	0.6-2	0.18-0.22	Low	1.0-3.0	.32	.32	2	6	48
	3-16	35-50	1.40-1.60	0.01-0.06	0.11-0.16	High	0.5-2.0	.32	.32			
	16-80	35-45	1.40-1.60	0.01-0.06	0.11-0.16	High	0.0-1.0	.32	.32			
Co:												
Colvin, saline-----	0-14	27-34	1.20-1.50	0.2-0.6	0.13-0.16	Moderate	4.0-7.0	.37	.37	5	4L	86
	14-80	18-34	1.30-1.50	0.06-2	0.11-0.15	Moderate	0.0-5.0	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
Cr:												
Cresbard-----	0-8	20-26	1.15-1.30	0.6-2	0.17-0.20	Low	2.0-5.0	.32	.32	5	6	48
	8-11	27-40	1.20-1.35	0.2-0.6	0.14-0.17	Moderate	1.0-3.0	.32	.32			
	11-22	35-50	1.20-1.35	0.06-0.6	0.11-0.14	High	0.0-2.0	.32	.32			
	22-38	35-50	1.20-1.35	0.06-0.6	0.11-0.15	High	0.0-0.5	.37	.37			
	38-80	25-35	1.40-1.60	0.2-0.6	0.16-0.20	Moderate	0.0-0.5	.37	.37			
Cavour-----	0-9	18-25	1.10-1.25	0.6-2	0.18-0.20	Low	2.0-4.0	.32	.32	2	6	48
	9-22	35-50	1.25-1.40	0.001-0.06	0.10-0.16	High	1.0-4.0	.28	.28			
	22-45	25-50	1.25-1.50	0.06-0.2	0.10-0.16	High	0.0-1.0	.37	.37			
	45-80	25-35	1.50-1.75	0.06-0.6	0.11-0.15	Moderate	0.0-0.5	.37	.37			
Cs:												
Cresbard-----	0-8	20-26	1.15-1.30	0.6-2	0.17-0.20	Low	2.0-5.0	.32	.32	5	6	48
	8-11	27-40	1.20-1.35	0.2-0.6	0.14-0.17	Moderate	1.0-3.0	.32	.32			
	11-22	35-50	1.20-1.35	0.06-0.6	0.11-0.14	High	0.0-2.0	.32	.32			
	22-38	35-50	1.20-1.35	0.06-0.6	0.11-0.15	High	0.0-0.5	.37	.37			
	38-80	25-35	1.40-1.60	0.2-0.6	0.16-0.20	Moderate	0.0-0.5	.37	.37			
Cavour-----	0-9	18-25	1.10-1.25	0.6-2	0.18-0.20	Low	2.0-4.0	.32	.32	2	6	48
	9-22	35-50	1.25-1.40	0.001-0.06	0.10-0.16	High	1.0-4.0	.28	.28			
	22-45	25-50	1.25-1.50	0.06-0.2	0.10-0.16	High	0.0-1.0	.37	.37			
	45-80	25-35	1.50-1.75	0.06-0.6	0.11-0.15	Moderate	0.0-0.5	.37	.37			
Heil-----	0-2	18-27	1.20-1.40	0.6-2	0.15-0.24	Moderate	3.0-6.0	.37	.37	2	6	48
	2-24	45-60	1.20-1.55	0.01-0.06	0.13-0.18	High	0.0-1.0	.37	.37			
	24-80	27-50	1.20-1.70	0.06-0.2	0.13-0.18	High	0.0-0.5	.32	.32			
Ct:												
Crossplain-----	0-15	23-27	1.15-1.25	0.6-2	0.18-0.20	Moderate	3.0-6.0	.32	.32	5	6	48
	15-30	35-45	1.25-1.45	0.06-0.6	0.11-0.17	High	1.0-3.0	.32	.32			
	30-59	25-35	1.50-1.70	0.06-0.6	0.16-0.20	Moderate	0.5-1.0	.37	.37			
	59-80	25-35	1.50-1.70	0.06-0.6	0.16-0.20	Moderate	0.0-0.5	.37	.37			
Tetonka-----	0-13	20-27	1.10-1.25	0.6-2	0.19-0.22	Moderate	4.0-8.0	.37	.37	5	6	48
	13-39	35-60	1.20-1.35	0.06-0.2	0.13-0.19	High	1.0-3.0	.28	.28			
	39-80	30-50	1.35-1.50	0.06-0.6	0.11-0.17	High	0.0-1.0	.32	.32			
Da:												
Davis-----	0-6	18-27	1.20-1.30	0.6-2	0.18-0.22	Low	4.0-6.0	.24	.24	5	6	48
	6-28	18-30	1.20-1.35	0.6-2	0.18-0.22	Moderate	3.0-5.0	.24	.24			
	28-80	18-27	1.25-1.40	0.6-2	0.18-0.20	Low	1.0-3.0	.24	.24			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
Da: (cont.)												
Northville-----	0-5	20-27	1.10-1.25	0.6-2	0.19-0.22	Low	2.0-4.0	.37	.37	5	6	48
	5-8	25-35	1.20-1.35	0.2-2	0.17-0.22	Moderate	1.0-2.0	.37	.37			
	8-22	35-50	1.20-1.35	0.06-0.2	0.13-0.18	High	0.5-3.0	.37	.37			
	22-58	20-50	1.20-1.35	0.06-2	0.14-0.17	Moderate	0.5-2.0	.37	.37			
	58-80	28-50	1.25-1.40	0.06-2	0.14-0.17	Moderate	0.0-0.5	.43	.43			
Db:												
Davison-----	0-8	18-26	1.20-1.30	0.6-2	0.18-0.20	Low	2.0-4.0	.28	.28	5	4L	86
	8-28	18-30	1.20-1.35	0.6-2	0.13-0.17	Moderate	1.0-3.0	.37	.37			
	28-53	18-30	1.25-1.35	0.6-2	0.16-0.20	Moderate	0.0-1.0	.37	.37			
	53-80	15-30	1.30-1.45	0.2-2	0.10-0.18	Low	0.0-0.5	.37	.43			
Dd:												
Davison-----	0-8	18-26	1.20-1.30	0.6-2	0.18-0.20	Low	2.0-6.0	.28	.28	5	4L	86
	8-28	18-30	1.20-1.35	0.6-2	0.13-0.17	Moderate	1.0-3.0	.37	.37			
	28-53	18-30	1.25-1.35	0.6-2	0.16-0.20	Moderate	0.0-1.0	.37	.37			
	53-80	15-30	1.30-1.45	0.2-2	0.10-0.18	Low	0.0-0.5	.37	.43			
Tetonka-----	0-13	20-27	1.10-1.25	0.6-2	0.19-0.22	Moderate	4.0-8.0	.37	.37	5	6	48
	13-39	35-60	1.20-1.35	0.06-0.2	0.13-0.19	High	1.0-3.0	.28	.28			
	39-80	30-50	1.35-1.50	0.06-0.6	0.11-0.17	High	0.0-1.0	.32	.32			
DeA:												
Delmont-----	0-7	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	2.0-4.0	.28	.28	3	6	48
	7-16	18-30	1.20-1.35	0.6-6	0.12-0.18	Low	1.0-2.0	.28	.32			
	16-80	0-5	1.60-1.75	6-60	0.03-0.06	Low	0.0-0.5	.10	.20			
Enet-----	0-7	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	2.0-4.0	.28	.28	4	6	48
	7-15	18-30	1.20-1.35	0.6-2	0.18-0.22	Low	0.5-2.0	.28	.28			
	15-28	15-30	1.20-1.35	0.6-6	0.11-0.20	Low	0.5-1.0	.28	.28			
	28-80	0-5	1.50-1.70	6-60	0.03-0.06	Low	0.0-0.5	.10	.17			
Dk:												
Dimo-----	0-7	20-26	1.20-1.30	0.6-2	0.18-0.20	Low	4.0-6.0	.24	.24	4	6	48
	7-31	20-34	1.30-1.40	0.6-2	0.16-0.20	Moderate	0.5-3.0	.28	.28			
	31-80	5-10	1.60-1.75	6-60	0.03-0.06	Low	0.0-0.5	.10	.15			
Dm:												
Dimo-----	0-7	20-26	1.20-1.30	0.6-2	0.18-0.20	Low	4.0-6.0	.24	.24	4	6	48
	7-31	20-34	1.30-1.40	0.6-2	0.16-0.20	Moderate	0.5-3.0	.28	.28			
	31-80	5-10	1.60-1.75	6-60	0.03-0.06	Low	0.0-0.5	.10	.15			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
Dm: (cont.)												
Grat-----	0-9	20-26	1.20-1.35	0.6-2	0.18-0.20	Low	4.0-6.0	.32	.32	4	6	48
	9-27	35-50	1.30-1.45	0.06-0.2	0.13-0.19	High	1.0-3.0	.32	.32			
	27-57	3-7	1.50-1.70	6-20	0.03-0.06	Low	0.0-1.0	.10	.17			
	57-80	25-35	1.35-1.50	0.2-0.6	0.16-0.20	Moderate	0.0-0.5	.32	.32			
DoA:												
Doland-----	0-7	18-26	1.30-1.45	0.6-2	0.20-0.22	Low	3.0-4.0	.24	.24	5	6	48
	7-28	18-26	1.30-1.45	0.6-2	0.18-0.20	Low	0.5-3.0	.32	.32			
	28-80	18-30	1.45-1.70	0.2-0.6	0.16-0.20	Moderate	0.0-0.5	.32	.32			
Embsden-----	0-15	10-18	1.25-1.35	2-6	0.13-0.18	Low	4.0-7.0	.20	.20	5	3	86
	15-38	10-18	1.30-1.60	2-6	0.12-0.17	Low	1.0-4.0	.24	.24			
	38-80	5-18	1.40-1.60	2-6	0.08-0.16	Low	0.0-1.0	.24	.24			
Dq:												
Dovecreek-----	0-16	20-27	1.15-1.30	0.6-2	0.20-0.22	Low	3.0-7.0	.28	.28	5	6	48
	16-30	25-35	1.20-1.35	0.6-2	0.18-0.22	Moderate	0.5-2.0	.32	.32			
	30-80	25-35	1.30-1.40	0.6-2	0.18-0.22	Moderate	0.0-0.5	.28	.28			
Dr:												
Dovray-----	0-16	40-60	1.20-1.30	0.06-0.6	0.14-0.18	High	5.0-8.0	.28	.28	5	4	86
	16-40	40-60	1.20-1.30	0.06-0.6	0.13-0.16	High	1.0-3.0	.37	.37			
	40-60	25-60	1.20-1.40	0.06-0.2	0.13-0.19	High	0.0-0.5	.37	.37			
Du:												
Dudley-----	0-7	18-25	1.00-1.20	0.6-2	0.18-0.22	Low	2.0-4.0	.37	.37	2	6	48
	7-18	35-50	1.35-1.45	0.001-0.06	0.10-0.14	High	1.0-3.0	.32	.32			
	18-39	30-50	1.40-1.50	0.06-0.2	0.10-0.14	High	0.5-2.0	.32	.32			
	39-80	20-35	1.55-1.65	0.06-0.6	0.11-0.15	Moderate	0.0-0.5	.37	.37			
Jerauld-----	0-2	15-25	1.10-1.25	0.6-2	0.18-0.22	Low	1.0-3.0	.37	.37	2	6	48
	2-14	35-60	1.15-1.30	0.001-0.06	0.10-0.15	High	1.0-2.0	.37	.37			
	14-33	35-60	1.15-1.30	0.06-0.2	0.10-0.15	High	0.0-2.0	.37	.37			
	33-80	27-45	1.35-1.60	0.06-0.2	0.08-0.13	High	0.0-0.5	.32	.32			
Dx:												
Durrstein-----	0-2	10-26	1.15-1.30	0.6-2	0.19-0.22	Low	1.0-3.0	.37	.37	2	6	48
	2-14	35-60	1.20-1.35	0.001-0.06	0.10-0.15	High	1.0-2.0	.37	.37			
	14-80	35-55	1.35-1.50	0.06-0.2	0.08-0.13	High	0.0-0.5	.37	.37			
Ea:												
Eckman-----	0-7	12-18	1.10-1.50	0.6-2	0.20-0.22	Low	2.0-6.0	.28	.28	5	3	86
	7-39	10-18	1.20-1.60	0.6-2	0.17-0.22	Low	0.0-3.0	.43	.43			
	39-80	10-18	1.20-1.70	0.6-2	0.14-0.22	Low	0.0-0.5	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
EcA:												
Eckman-----	0-7	12-18	1.10-1.50	0.6-2	0.20-0.22	Low	2.0-6.0	.28	.28	5	3	86
	7-39	10-18	1.20-1.60	0.6-2	0.17-0.22	Low	0.0-3.0	.43	.43			
	39-80	10-18	1.20-1.70	0.6-2	0.14-0.22	Low	0.0-0.5	.43	.43			
Gardena-----	0-20	12-18	1.10-1.50	0.6-6	0.20-0.22	Low	4.0-8.0	.28	.28	5	3	86
	20-80	10-18	1.20-1.70	0.6-6	0.14-0.22	Low	0.0-3.0	.43	.43			
EcB:												
Eckman-----	0-7	12-18	1.10-1.50	0.6-2	0.20-0.22	Low	2.0-6.0	.28	.28	5	3	86
	7-39	10-18	1.20-1.60	0.6-2	0.17-0.22	Low	0.0-3.0	.43	.43			
	39-80	10-18	1.20-1.70	0.6-2	0.14-0.22	Low	0.0-0.5	.43	.43			
Gardena-----	0-20	12-18	1.10-1.50	0.6-6	0.20-0.22	Low	4.0-8.0	.28	.28	5	3	86
	20-80	10-18	1.20-1.70	0.6-6	0.14-0.22	Low	0.0-3.0	.43	.43			
EdB:												
Eckman-----	0-7	12-18	1.10-1.50	0.6-2	0.20-0.22	Low	2.0-6.0	.28	.28	5	3	86
	7-39	10-18	1.20-1.60	0.6-2	0.17-0.22	Low	0.0-3.0	.43	.43			
	39-80	10-18	1.20-1.70	0.6-2	0.14-0.22	Low	0.0-0.5	.43	.43			
Zell-----	0-7	12-18	1.10-1.50	0.6-2	0.20-0.22	Low	2.0-6.0	.28	.28	5	3	86
	7-31	10-18	1.25-1.40	0.6-2	0.15-0.20	Low	0.0-1.0	.43	.43			
	31-80	5-18	1.25-1.40	0.06-2	0.15-0.20	Low	0.0-0.5	.43	.43			
EeB:												
Edgeley-----	0-8	18-26	1.30-1.40	0.6-2	0.20-0.22	Low	3.0-7.0	.32	.32	3	6	48
	8-25	18-34	1.30-1.50	0.6-2	0.13-0.19	Moderate	0.0-2.0	.37	.37			
	25-80	---	---	0.001-0.06	---	---	0.0-0.5	---	---			
EeC:												
Edgeley-----	0-8	18-26	1.30-1.40	0.6-2	0.20-0.22	Low	3.0-7.0	.32	.32	3	6	48
	8-25	18-34	1.30-1.50	0.6-2	0.13-0.19	Moderate	0.0-2.0	.37	.37			
	25-80	---	---	0.001-0.06	---	---	0.0-0.5	---	---			
EeD:												
Edgeley-----	0-8	18-26	1.30-1.40	0.6-2	0.20-0.22	Low	3.0-7.0	.32	.32	3	6	48
	8-25	18-34	1.30-1.50	0.6-2	0.13-0.19	Moderate	0.0-2.0	.37	.37			
	25-80	---	---	0.001-0.06	---	---	0.0-0.5	---	---			
EgA:												
Egeland-----	0-8	10-18	1.25-1.35	2-6	0.11-0.17	Low	1.0-3.0	.20	.20	5	3	86
	8-31	10-18	1.30-1.45	2-6	0.09-0.15	Low	0.5-2.0	.20	.20			
	31-64	5-10	1.40-1.65	2-6	0.08-0.10	Low	0.0-0.5	.17	.17			
	64-80	6-14	1.40-1.65	0.6-2	0.10-0.22	Low	0.0-0.5	.17	.17			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
EgA: (cont.)												
Embden-----	0-15	10-18	1.25-1.35	2-6	0.13-0.18	Low	4.0-7.0	.20	.20	5	3	86
	15-38	10-18	1.30-1.60	2-6	0.12-0.17	Low	1.0-4.0	.24	.24			
	38-80	5-18	1.40-1.60	2-6	0.08-0.16	Low	0.0-1.0	.24	.24			
EgB:												
Egeland-----	0-8	10-18	1.25-1.35	2-6	0.11-0.17	Low	1.0-3.0	.20	.20	5	3	86
	8-31	10-18	1.30-1.45	2-6	0.09-0.15	Low	0.5-2.0	.20	.20			
	31-64	5-10	1.40-1.65	2-6	0.08-0.10	Low	0.0-0.5	.17	.17			
	64-80	6-14	1.40-1.65	0.6-2	0.10-0.22	Low	0.0-0.5	.17	.17			
Embden-----	0-15	10-18	1.25-1.35	2-6	0.13-0.18	Low	4.0-7.0	.20	.20	5	3	86
	15-38	10-18	1.30-1.60	2-6	0.12-0.17	Low	1.0-4.0	.24	.24			
	38-80	5-18	1.40-1.60	2-6	0.08-0.16	Low	0.0-1.0	.24	.24			
Ek:												
Elsmere-----	0-19	3-10	1.50-1.70	6-20	0.10-0.12	Low	1.0-4.0	.17	.17	5	2	134
	19-46	0-5	1.50-1.70	6-20	0.08-0.10	Low	0.5-1.0	.17	.17			
	46-80	12-30	1.50-1.70	0.2-0.6	0.12-0.20	Moderate	0.0-0.5	.32	.32			
EmE:												
Ethan-----	0-8	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	1.0-3.0	.28	.28	5	4L	86
	8-20	18-30	1.30-1.45	0.6-2	0.16-0.20	Moderate	0.5-1.0	.32	.32			
	20-32	18-30	1.45-1.70	0.6-2	0.16-0.20	Moderate	0.0-0.5	.37	.43			
	32-60	18-30	1.45-1.70	0.2-2	0.16-0.20	Moderate	0.0-0.5	.37	.43			
Betts-----	0-3	18-27	1.20-1.30	0.6-2	0.16-0.18	Low	1.0-3.0	.28	.28	5	4L	86
	3-29	20-35	1.20-1.35	0.6-2	0.17-0.20	Moderate	0.0-1.0	.32	.32			
	29-80	20-35	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
EnD:												
Ethan-----	0-8	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	1.0-3.0	.28	.28	5	4L	86
	8-20	18-30	1.30-1.45	0.6-2	0.16-0.20	Moderate	0.5-1.0	.32	.32			
	20-32	18-30	1.45-1.70	0.6-2	0.16-0.20	Moderate	0.0-0.5	.37	.43			
	32-60	18-30	1.45-1.70	0.2-2	0.16-0.20	Moderate	0.0-0.5	.37	.43			
Hand-----	0-7	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	2.0-4.0	.28	.28	5	6	48
	7-18	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	1.0-3.0	.28	.28			
	18-35	18-30	1.20-1.35	0.6-2	0.18-0.22	Moderate	0.5-2.0	.28	.28			
	35-80	18-30	1.25-1.40	0.6-2	0.12-0.18	Moderate	0.0-0.5	.28	.28			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
Er:												
Exline-----	0-2	20-26	1.25-1.30	0.6-2	0.19-0.22	Low	1.0-3.0	.37	.37	2	6	48
	2-21	35-55	1.25-1.40	0.01-0.06	0.10-0.15	High	0.0-2.0	.28	.28			
	21-40	35-50	1.25-1.40	0.06-0.2	0.14-0.17	High	0.0-1.0	.43	.43			
	40-80	25-35	1.25-1.40	0.06-0.2	0.14-0.17	Moderate	0.0-0.5	.43	.43			
Aberdeen-----	0-13	20-33	1.15-1.25	0.2-0.6	0.19-0.22	Moderate	3.0-4.0	.37	.37	5	6	48
	13-23	35-55	1.20-1.35	0.06-0.2	0.13-0.18	High	1.0-4.0	.37	.37			
	23-39	30-55	1.20-1.35	0.06-0.2	0.14-0.17	High	0.0-2.0	.37	.37			
	39-80	10-26	1.25-1.40	0.06-2	0.14-0.17	Low	0.0-1.0	.43	.43			
Nahon-----	0-7	23-26	1.20-1.30	0.2-0.6	0.19-0.22	Low	2.0-5.0	.37	.37	2	6	48
	7-9	20-30	1.20-1.35	0.2-0.6	0.19-0.22	Moderate	1.0-2.0	.37	.37			
	9-21	35-55	1.25-1.45	0.01-0.06	0.10-0.15	High	1.0-3.0	.37	.37			
	21-43	23-55	1.20-1.35	0.06-0.2	0.11-0.19	High	0.0-1.0	.37	.37			
	43-49	30-60	1.20-1.40	0.06-0.6	0.14-0.17	Moderate	0.0-0.5	.43	.43			
	49-80	25-30	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
Et:												
Exline-----	0-2	20-26	1.25-1.30	0.6-2	0.19-0.22	Low	1.0-3.0	.37	.37	2	6	48
	2-24	35-55	1.25-1.40	0.01-0.06	0.10-0.15	High	0.0-2.0	.28	.28			
	24-39	35-50	1.25-1.40	0.06-0.2	0.14-0.17	High	0.0-1.0	.43	.43			
	39-55	25-35	1.25-1.40	0.06-0.2	0.14-0.17	Moderate	0.0-0.5	.43	.43			
	55-80	25-30	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
Aberdeen-----	0-11	20-26	1.10-1.25	0.6-2	0.19-0.22	Moderate	3.0-4.0	.37	.37	5	6	48
	11-23	35-55	1.20-1.35	0.06-0.2	0.13-0.18	High	1.0-4.0	.37	.37			
	23-36	30-55	1.20-1.35	0.06-0.2	0.14-0.17	High	1.0-4.0	.37	.37			
	36-49	10-30	1.25-1.40	0.06-2	0.14-0.17	Moderate	0.0-1.0	.43	.43			
	49-80	25-30	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
Nahon-----	0-7	23-26	1.20-1.30	0.2-0.6	0.19-0.22	Low	2.0-5.0	.37	.37	2	6	48
	7-9	20-30	1.20-1.35	0.2-0.6	0.19-0.22	Moderate	1.0-2.0	.37	.37			
	9-21	35-55	1.25-1.45	0.01-0.06	0.10-0.15	High	1.0-3.0	.37	.37			
	21-43	23-55	1.20-1.35	0.06-0.2	0.11-0.19	High	0.0-1.0	.37	.37			
	43-49	30-60	1.20-1.40	0.06-0.6	0.14-0.17	Moderate	0.0-0.5	.43	.43			
	49-80	25-30	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
Ew:												
Exline-----	0-2	20-26	1.25-1.30	0.6-2	0.19-0.22	Low	1.0-3.0	.37	.37	2	6	48
	2-21	35-55	1.25-1.40	0.01-0.06	0.10-0.15	High	0.0-2.0	.28	.28			
	21-40	35-50	1.25-1.40	0.06-0.2	0.14-0.17	High	0.0-1.0	.43	.43			
	40-80	25-35	1.25-1.40	0.06-0.2	0.14-0.17	Moderate	0.0-0.5	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
Ew: (cont.)												
Heil-----	0-2	18-27	1.20-1.40	0.6-2	0.15-0.24	Moderate	3.0-6.0	.37	.37	2	6	48
	2-24	45-60	1.20-1.55	0.01-0.06	0.13-0.18	High	0.0-1.0	.37	.37			
	24-80	27-50	1.20-1.70	0.06-0.2	0.13-0.18	High	0.0-0.5	.32	.32			
Ex:												
Exline-----	0-2	20-26	1.25-1.30	0.6-2	0.19-0.22	Low	1.0-3.0	.37	.37	2	6	48
	2-24	35-55	1.25-1.40	0.01-0.06	0.10-0.15	High	0.0-2.0	.28	.28			
	24-39	35-50	1.25-1.40	0.06-0.2	0.14-0.17	High	0.0-1.0	.43	.43			
	39-55	25-35	1.25-1.40	0.06-0.2	0.14-0.17	Moderate	0.0-0.5	.43	.43			
	55-80	25-30	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
Heil-----	0-2	18-27	1.20-1.40	0.6-2	0.15-0.24	Moderate	3.0-6.0	.37	.37	2	6	48
	2-24	45-60	1.20-1.55	0.01-0.06	0.13-0.18	High	0.0-1.0	.37	.37			
	24-47	27-50	1.20-1.70	0.06-0.2	0.13-0.18	High	0.0-0.5	.32	.32			
	47-80	27-50	1.20-1.70	0.06-0.2	0.13-0.18	High	0.0-0.5	.32	.32			
EyA:												
Exline-----	0-2	20-26	1.25-1.30	0.6-2	0.19-0.22	Low	1.0-3.0	.37	.37	2	6	48
	2-21	35-55	1.25-1.40	0.01-0.06	0.10-0.15	High	0.0-2.0	.28	.28			
	21-40	35-50	1.25-1.40	0.06-0.2	0.14-0.17	High	0.0-1.0	.43	.43			
	40-80	25-35	1.25-1.40	0.06-0.2	0.14-0.17	Moderate	0.0-0.5	.43	.43			
Putney-----	0-7	20-26	1.10-1.25	0.6-2	0.19-0.22	Moderate	2.0-6.0	.37	.37	5	6	48
	7-15	18-30	1.15-1.30	0.6-2	0.19-0.22	Moderate	1.0-4.0	.37	.37			
	15-37	20-45	1.15-1.30	0.6-2	0.14-0.17	Moderate	0.5-2.0	.43	.43			
	37-80	18-25	1.20-1.35	0.06-2	0.14-0.17	Low	0.5-2.0	.43	.43			
Fa:												
Farmsworth-----	0-8	20-27	1.15-1.25	0.6-2	0.18-0.22	Low	2.0-4.0	.32	.32	2	6	48
	8-25	35-60	1.25-1.40	0.001-0.06	0.10-0.14	High	0.5-2.0	.37	.37			
	25-43	35-55	1.25-1.40	0.06-0.2	0.08-0.12	High	0.0-2.0	.37	.37			
	43-80	25-35	1.30-1.50	0.06-0.6	0.16-0.18	Moderate	0.0-0.5	.37	.37			
Durrstein-----	0-2	10-26	1.15-1.30	0.6-2	0.19-0.22	Low	1.0-3.0	.37	.37	2	6	48
	2-14	35-60	1.20-1.35	0.001-0.06	0.10-0.15	High	1.0-2.0	.37	.37			
	14-80	35-55	1.35-1.50	0.06-0.2	0.08-0.13	High	0.0-0.5	.37	.37			
Fe:												
Ferney-----	0-3	18-26	1.15-1.30	0.6-2	0.18-0.22	Low	1.0-3.0	.32	.32	2	6	48
	3-16	35-50	1.40-1.60	0.01-0.06	0.11-0.16	High	0.5-2.0	.32	.32			
	16-80	35-45	1.40-1.60	0.01-0.06	0.11-0.16	High	0.0-1.0	.32	.32			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
Fe: (cont.)												
Heil-----	0-2	18-27	1.20-1.40	0.6-2	0.15-0.24	Moderate	3.0-6.0	.37	.37	2	6	48
	2-24	45-60	1.20-1.55	0.01-0.06	0.13-0.18	High	0.0-1.0	.37	.37			
	24-80	27-50	1.20-1.70	0.06-0.2	0.13-0.18	High	0.0-0.5	.32	.32			
Ff:												
Forestburg-----	0-7	5-10	1.20-1.30	6-20	0.10-0.12	Low	1.0-2.0	.17	.17	5	2	134
	7-36	5-10	1.25-1.35	6-20	0.08-0.10	Low	0.5-1.0	.17	.17			
	36-53	20-30	1.35-1.55	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
	53-80	15-25	1.30-1.50	0.2-0.6	0.08-0.18	Low	0.0-0.5	.37	.37			
Elsmere-----	0-19	3-10	1.50-1.70	6-20	0.10-0.12	Low	1.0-4.0	.17	.17	5	2	134
	19-46	0-5	1.50-1.70	6-20	0.08-0.10	Low	0.5-1.0	.17	.17			
	46-80	12-30	1.50-1.70	0.2-0.6	0.12-0.20	Moderate	0.0-0.5	.32	.32			
Fh:												
Forestburg-----	0-7	5-10	1.20-1.30	6-20	0.10-0.12	Low	1.0-2.0	.17	.17	5	2	134
	7-36	5-10	1.25-1.35	6-20	0.08-0.10	Low	0.5-1.0	.17	.17			
	36-53	20-30	1.35-1.55	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
	53-80	15-25	1.30-1.50	0.2-0.6	0.08-0.18	Low	0.0-0.5	.37	.37			
Elsmere-----	0-19	3-10	1.50-1.70	6-20	0.10-0.12	Low	1.0-4.0	.17	.17	5	2	134
	19-46	0-5	1.50-1.70	6-20	0.08-0.10	Low	0.5-1.0	.17	.17			
	46-80	12-30	1.50-1.70	0.2-0.6	0.12-0.20	Moderate	0.0-0.5	.32	.32			
Toko-----	0-8	5-15	1.25-1.35	2-6	0.11-0.17	Low	3.0-6.0	.24	.24	5	3	86
	8-11	5-10	1.25-1.35	2-6	0.08-0.15	Low	0.0-2.0	.24	.24			
	11-28	18-35	1.25-1.50	0.2-0.6	0.12-0.18	Moderate	0.0-2.0	.32	.32			
	28-56	5-20	1.25-1.45	0.6-6	0.08-0.18	Low	0.0-0.5	.32	.32			
	56-80	15-30	1.50-1.70	0.2-0.6	0.16-0.20	Moderate	0.0-0.5	.37	.37			
FmA:												
Forman-----	0-8	18-27	1.20-1.40	0.6-2	0.20-0.24	Low	3.0-5.0	.24	.24	5	6	48
	8-15	30-35	1.30-1.50	0.6-2	0.15-0.19	Moderate	1.0-3.0	.32	.32			
	15-80	18-35	1.30-1.50	0.2-0.6	0.14-0.19	Moderate	0.0-0.5	.37	.37			
Aastad-----	0-14	24-27	1.35-1.45	0.6-2	0.18-0.20	Moderate	4.0-6.0	.24	.24	5	6	48
	14-29	28-35	1.45-1.60	0.2-0.6	0.15-0.19	Moderate	2.0-5.0	.28	.28			
	29-80	24-35	1.55-1.65	0.2-0.6	0.14-0.16	Moderate	0.0-0.5	.37	.37			
FmB:												
Forman-----	0-8	18-27	1.20-1.40	0.6-2	0.20-0.24	Low	3.0-5.0	.24	.24	5	6	48
	8-15	30-35	1.30-1.50	0.6-2	0.15-0.19	Moderate	1.0-3.0	.32	.32			
	15-80	18-35	1.30-1.50	0.2-0.6	0.14-0.19	Moderate	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
FmB: (cont.)												
Aastad-----	0-14	24-27	1.35-1.45	0.6-2	0.18-0.20	Moderate	4.0-6.0	.24	.24	5	6	48
	14-29	28-35	1.45-1.60	0.2-0.6	0.15-0.19	Moderate	2.0-5.0	.28	.28			
	29-80	24-35	1.55-1.65	0.2-0.6	0.14-0.16	Moderate	0.0-0.5	.37	.37			
FnC:												
Forman-----	0-8	18-27	1.20-1.40	0.6-2	0.20-0.24	Low	3.0-5.0	.24	.24	5	6	48
	8-15	30-35	1.30-1.50	0.6-2	0.15-0.19	Moderate	1.0-3.0	.32	.32			
	15-80	18-35	1.30-1.50	0.2-0.6	0.14-0.19	Moderate	0.0-0.5	.37	.37			
Buse-----	0-7	18-27	1.40-1.50	0.2-0.6	0.17-0.22	Low	1.0-3.0	.28	.28	5	4L	86
	7-35	18-35	1.55-1.65	0.2-0.6	0.14-0.19	Moderate	0.5-1.0	.37	.37			
	35-80	18-35	1.55-1.65	0.2-0.6	0.14-0.19	Moderate	0.0-0.5	.37	.37			
FrB:												
Forman-----	0-8	18-27	1.20-1.40	0.6-2	0.20-0.24	Low	3.0-5.0	.24	.24	5	6	48
	8-15	30-35	1.30-1.50	0.6-2	0.15-0.19	Moderate	1.0-3.0	.32	.32			
	15-80	18-35	1.30-1.50	0.2-0.6	0.14-0.19	Moderate	0.0-0.5	.37	.37			
Buse-----	0-7	18-27	1.40-1.50	0.2-0.6	0.17-0.22	Low	1.0-3.0	.28	.28	5	4L	86
	7-35	18-35	1.55-1.65	0.2-0.6	0.14-0.19	Moderate	0.5-1.0	.37	.37			
	35-80	18-35	1.55-1.65	0.2-0.6	0.14-0.19	Moderate	0.0-0.5	.37	.37			
Aastad-----	0-14	24-27	1.35-1.45	0.6-2	0.18-0.20	Moderate	4.0-6.0	.24	.24	5	6	48
	14-29	28-35	1.45-1.60	0.2-0.6	0.15-0.19	Moderate	2.0-5.0	.28	.28			
	29-80	24-35	1.55-1.65	0.2-0.6	0.14-0.16	Moderate	0.0-0.5	.37	.37			
FrC:												
Forman-----	0-8	18-27	1.20-1.40	0.6-2	0.20-0.24	Low	3.0-5.0	.24	.24	5	6	48
	8-15	30-35	1.30-1.50	0.6-2	0.15-0.19	Moderate	1.0-3.0	.32	.32			
	15-80	18-35	1.30-1.50	0.2-0.6	0.14-0.19	Moderate	0.0-0.5	.37	.37			
Buse-----	0-7	18-27	1.40-1.50	0.2-0.6	0.17-0.22	Low	1.0-3.0	.28	.28	5	4L	86
	7-35	18-35	1.55-1.65	0.2-0.6	0.14-0.19	Moderate	0.5-1.0	.37	.37			
	35-80	18-35	1.55-1.65	0.2-0.6	0.14-0.19	Moderate	0.0-0.5	.37	.37			
Aastad-----	0-14	24-27	1.35-1.45	0.6-2	0.18-0.20	Moderate	4.0-6.0	.24	.24	5	6	48
	14-29	28-35	1.45-1.60	0.2-0.6	0.15-0.19	Moderate	2.0-5.0	.28	.28			
	29-80	24-35	1.55-1.65	0.2-0.6	0.14-0.16	Moderate	0.0-0.5	.37	.37			
FsA:												
Forman-----	0-8	18-27	1.20-1.40	0.6-2	0.20-0.24	Low	3.0-5.0	.24	.24	5	6	48
	8-15	30-35	1.30-1.50	0.6-2	0.15-0.19	Moderate	1.0-3.0	.32	.32			
	15-80	18-35	1.30-1.50	0.2-0.6	0.14-0.19	Moderate	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
FsA: (cont.)												
Cresbard-----	0-8	20-26	1.15-1.30	0.6-2	0.17-0.20	Low	2.0-5.0	.32	.32	5	6	48
	8-11	27-40	1.20-1.35	0.2-0.6	0.14-0.17	Moderate	1.0-3.0	.32	.32			
	11-22	35-50	1.20-1.35	0.06-0.6	0.11-0.14	High	0.0-2.0	.32	.32			
	22-38	35-50	1.20-1.35	0.06-0.6	0.11-0.15	High	0.0-0.5	.37	.37			
	38-80	25-35	1.40-1.60	0.2-0.6	0.16-0.20	Moderate	0.0-0.5	.37	.37			
FsB:												
Forman-----	0-8	18-27	1.20-1.40	0.6-2	0.20-0.24	Low	3.0-5.0	.24	.24	5	6	48
	8-15	30-35	1.30-1.50	0.6-2	0.15-0.19	Moderate	1.0-3.0	.32	.32			
	15-80	18-35	1.30-1.50	0.2-0.6	0.14-0.19	Moderate	0.0-0.5	.37	.37			
Cresbard-----	0-8	20-26	1.15-1.30	0.6-2	0.17-0.20	Low	2.0-5.0	.32	.32	5	6	48
	8-11	27-40	1.20-1.35	0.2-0.6	0.14-0.17	Moderate	1.0-3.0	.32	.32			
	11-22	35-50	1.20-1.35	0.06-0.6	0.11-0.14	High	0.0-2.0	.32	.32			
	22-38	35-50	1.20-1.35	0.06-0.6	0.11-0.15	High	0.0-0.5	.37	.37			
	38-80	25-35	1.40-1.60	0.2-0.6	0.16-0.20	Moderate	0.0-0.5	.37	.37			
FtA:												
Forman-----	0-8	18-27	1.20-1.40	0.6-2	0.20-0.24	Low	3.0-5.0	.24	.24	5	6	48
	8-15	30-35	1.30-1.50	0.6-2	0.15-0.19	Moderate	1.0-3.0	.32	.32			
	15-80	18-35	1.30-1.50	0.2-0.6	0.14-0.19	Moderate	0.0-0.5	.37	.37			
Cresbard-----	0-8	20-26	1.15-1.30	0.6-2	0.17-0.20	Low	2.0-5.0	.32	.32	5	6	48
	8-11	27-40	1.20-1.35	0.2-0.6	0.14-0.17	Moderate	1.0-3.0	.32	.32			
	11-22	35-50	1.20-1.35	0.06-0.6	0.11-0.14	High	0.0-2.0	.32	.32			
	22-38	35-50	1.20-1.35	0.06-0.6	0.11-0.15	High	0.0-0.5	.37	.37			
	38-80	25-35	1.40-1.60	0.2-0.6	0.16-0.20	Moderate	0.0-0.5	.37	.37			
Tonka-----	0-16	18-27	1.10-1.30	0.6-2	0.20-0.24	Low	5.0-10	.37	.37	5	6	48
	16-41	35-50	1.40-1.65	0.06-0.2	0.14-0.20	High	1.0-3.0	.43	.43			
	41-80	27-39	1.40-1.70	0.2-2	0.14-0.19	Moderate	0.0-1.0	.37	.37			
Ga:												
Gardena-----	0-20	12-18	1.10-1.50	0.6-6	0.20-0.22	Low	4.0-8.0	.28	.28	5	3	86
	20-80	10-18	1.20-1.70	0.6-6	0.14-0.22	Low	0.0-3.0	.43	.43			
Gd:												
Gardena-----	0-20	12-18	1.10-1.40	0.6-2	0.20-0.24	Low	4.0-8.0	.28	.28	5	5	56
	20-80	10-18	1.20-1.70	0.6-6	0.14-0.22	Low	0.0-3.0	.43	.43			
Glyndon-----	0-12	15-27	1.20-1.40	0.6-2	0.20-0.23	Low	3.0-4.0	.28	.28	5	4L	86
	12-46	10-18	1.30-1.50	0.6-6	0.17-0.20	Low	1.0-2.0	.43	.43			
	46-80	5-18	1.35-1.65	2-6	0.15-0.19	Low	0.0-0.5	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
Ge:												
Gardena-----	0-20	12-18	1.10-1.50	0.6-6	0.20-0.22	Low	4.0-8.0	.28	.28	5	3	86
	20-80	10-18	1.20-1.70	0.6-6	0.14-0.22	Low	0.0-3.0	.43	.43			
Turton-----	0-8	5-10	1.20-1.35	0.6-2	0.14-0.19	Low	3.0-4.0	.24	.24	2	3	86
	8-10	5-15	1.25-1.40	0.6-2	0.15-0.18	Low	1.0-3.0	.24	.24			
	10-24	18-30	1.25-1.50	0.06-0.2	0.13-0.17	Moderate	0.0-1.0	.37	.37			
	24-38	10-28	1.25-1.45	0.06-0.6	0.12-0.18	Moderate	0.0-0.5	.37	.37			
	38-80	5-25	1.20-1.45	0.06-2	0.12-0.20	Low	0.0-0.5	.43	.43			
GgA:												
Great Bend-----	0-7	20-26	1.10-1.25	0.6-2	0.19-0.22	Low	2.0-4.0	.32	.32	5	6	48
	7-12	18-30	1.15-1.30	0.6-2	0.17-0.20	Moderate	1.0-3.0	.32	.32			
	12-32	18-30	1.15-1.30	0.6-2	0.17-0.20	Low	0.0-1.0	.43	.43			
	32-53	18-25	1.20-1.35	0.2-0.6	0.17-0.20	Low	0.0-0.5	.43	.43			
	53-80	18-25	1.20-1.35	0.06-2	0.17-0.20	Low	0.0-0.5	.43	.43			
GnA:												
Great Bend-----	0-7	20-26	1.10-1.25	0.6-2	0.19-0.22	Low	2.0-4.0	.32	.32	5	6	48
	7-12	18-30	1.15-1.30	0.6-2	0.17-0.20	Moderate	1.0-3.0	.32	.32			
	12-32	18-30	1.15-1.30	0.6-2	0.17-0.20	Low	0.0-1.0	.43	.43			
	32-53	18-25	1.20-1.35	0.2-0.6	0.17-0.20	Low	0.0-0.5	.43	.43			
	53-80	18-25	1.20-1.35	0.06-2	0.17-0.20	Low	0.0-0.5	.43	.43			
Beotia-----	0-9	20-27	1.10-1.25	0.6-2	0.19-0.22	Low	4.0-8.0	.28	.28	5	6	48
	9-21	18-30	1.15-1.30	0.6-2	0.19-0.22	Moderate	2.0-4.0	.32	.32			
	21-39	18-30	1.20-1.35	0.2-2	0.17-0.20	Moderate	0.5-2.0	.37	.37			
	39-80	18-35	1.20-1.35	0.06-2	0.17-0.20	Moderate	0.0-0.5	.43	.43			
GnB:												
Great Bend-----	0-7	20-26	1.10-1.25	0.6-2	0.19-0.22	Low	2.0-4.0	.32	.32	5	6	48
	7-12	18-30	1.15-1.30	0.6-2	0.17-0.20	Moderate	1.0-3.0	.32	.32			
	12-32	18-30	1.15-1.30	0.6-2	0.17-0.20	Low	0.0-1.0	.43	.43			
	32-53	18-25	1.20-1.35	0.2-0.6	0.17-0.20	Low	0.0-0.5	.43	.43			
	53-80	18-25	1.20-1.35	0.06-2	0.17-0.20	Low	0.0-0.5	.43	.43			
Beotia-----	0-9	20-27	1.10-1.25	0.6-2	0.19-0.22	Low	4.0-8.0	.28	.28	5	6	48
	9-21	18-30	1.15-1.30	0.6-2	0.19-0.22	Moderate	2.0-4.0	.32	.32			
	21-39	18-30	1.20-1.35	0.2-2	0.17-0.20	Moderate	0.5-2.0	.37	.37			
	39-80	18-35	1.20-1.35	0.06-2	0.17-0.20	Moderate	0.0-0.5	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
GoA:												
Great Bend-----	0-7	20-26	1.10-1.25	0.6-2	0.19-0.22	Moderate	2.0-4.0	.32	.32	5	6	48
	7-14	18-30	1.15-1.30	0.6-2	0.17-0.20	Moderate	1.0-3.0	.32	.32			
	14-29	18-30	1.15-1.30	0.6-2	0.17-0.20	Low	0.0-1.0	.43	.43			
	29-49	18-25	1.20-1.35	0.06-2	0.17-0.20	Low	0.0-0.5	.43	.43			
	49-80	25-30	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
Beotia-----	0-12	20-27	1.10-1.25	0.6-2	0.19-0.22	Low	4.0-8.0	.28	.28	5	6	48
	12-27	18-30	1.15-1.30	0.6-2	0.19-0.22	Moderate	2.0-4.0	.32	.32			
	27-46	18-30	1.20-1.35	0.2-2	0.17-0.20	Moderate	1.0-3.0	.37	.37			
	46-52	18-35	1.20-1.35	0.06-2	0.17-0.20	Moderate	0.0-0.5	.43	.43			
	52-80	25-30	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
GpA:												
Great Bend-----	0-7	20-26	1.10-1.25	0.6-2	0.19-0.22	Low	2.0-4.0	.32	.32	5	6	48
	7-12	18-30	1.15-1.30	0.6-2	0.17-0.20	Moderate	1.0-3.0	.32	.32			
	12-32	18-30	1.15-1.30	0.6-2	0.17-0.20	Low	0.0-1.0	.43	.43			
	32-53	18-25	1.20-1.35	0.2-0.6	0.17-0.20	Low	0.0-0.5	.43	.43			
	53-80	18-25	1.20-1.35	0.06-2	0.17-0.20	Low	0.0-0.5	.43	.43			
Putney-----	0-7	20-26	1.10-1.25	0.6-2	0.19-0.22	Moderate	2.0-6.0	.37	.37	5	6	48
	7-15	18-30	1.15-1.30	0.6-2	0.19-0.22	Moderate	1.0-4.0	.37	.37			
	15-37	20-45	1.15-1.30	0.6-2	0.14-0.17	Moderate	0.5-2.0	.43	.43			
	37-80	18-25	1.20-1.35	0.06-2	0.14-0.17	Low	0.5-2.0	.43	.43			
GpB:												
Great Bend-----	0-7	20-26	1.10-1.25	0.6-2	0.19-0.22	Low	2.0-4.0	.32	.32	5	6	48
	7-12	18-30	1.15-1.30	0.6-2	0.17-0.20	Moderate	1.0-3.0	.32	.32			
	12-32	18-30	1.15-1.30	0.6-2	0.17-0.20	Low	0.0-1.0	.43	.43			
	32-53	18-25	1.20-1.35	0.2-0.6	0.17-0.20	Low	0.0-0.5	.43	.43			
	53-80	18-25	1.20-1.35	0.06-2	0.17-0.20	Low	0.0-0.5	.43	.43			
Putney-----	0-7	20-26	1.10-1.25	0.6-2	0.19-0.22	Moderate	2.0-6.0	.37	.37	5	6	48
	7-15	18-30	1.15-1.30	0.6-2	0.19-0.22	Moderate	1.0-4.0	.37	.37			
	15-37	20-45	1.15-1.30	0.6-2	0.14-0.17	Moderate	0.5-2.0	.43	.43			
	37-80	18-25	1.20-1.35	0.06-2	0.14-0.17	Low	0.5-2.0	.43	.43			
GtB:												
Great Bend-----	0-7	20-26	1.10-1.25	0.6-2	0.19-0.22	Low	2.0-4.0	.32	.32	5	6	48
	7-12	18-30	1.15-1.30	0.6-2	0.17-0.20	Moderate	1.0-3.0	.32	.32			
	12-32	18-30	1.15-1.30	0.6-2	0.17-0.20	Low	0.0-1.0	.43	.43			
	32-53	18-25	1.20-1.35	0.2-0.6	0.17-0.20	Low	0.0-0.5	.43	.43			
	53-80	18-25	1.20-1.35	0.06-2	0.17-0.20	Low	0.0-0.5	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
GtB: (cont.)												
Zell-----	0-7	10-18	1.15-1.30	0.6-2	0.19-0.22	Low	1.0-3.0	.32	.32	5	4L	86
	7-31	10-18	1.25-1.40	0.6-2	0.15-0.20	Low	0.0-1.0	.43	.43			
	31-80	5-18	1.25-1.40	0.06-2	0.15-0.20	Low	0.0-0.5	.43	.43			
GtC:												
Great Bend-----	0-7	20-26	1.10-1.25	0.6-2	0.19-0.22	Low	2.0-4.0	.32	.32	5	6	48
	7-12	18-30	1.15-1.30	0.6-2	0.17-0.20	Moderate	1.0-3.0	.32	.32			
	12-32	18-30	1.15-1.30	0.6-2	0.17-0.20	Low	0.0-1.0	.43	.43			
	32-53	18-25	1.20-1.35	0.2-0.6	0.17-0.20	Low	0.0-0.5	.43	.43			
	53-80	18-25	1.20-1.35	0.06-2	0.17-0.20	Low	0.0-0.5	.43	.43			
Zell-----	0-7	10-18	1.15-1.30	0.6-2	0.19-0.22	Low	1.0-3.0	.32	.32	5	4L	86
	7-31	10-18	1.25-1.40	0.6-2	0.15-0.20	Low	0.0-1.0	.43	.43			
	31-80	5-18	1.25-1.40	0.06-2	0.15-0.20	Low	0.0-0.5	.43	.43			
GzC:												
Great Bend-----	0-7	20-26	1.10-1.25	0.6-2	0.19-0.22	Low	2.0-4.0	.32	.32	5	6	48
	7-12	18-30	1.15-1.30	0.6-2	0.17-0.20	Moderate	1.0-3.0	.32	.32			
	12-32	18-30	1.15-1.30	0.6-2	0.17-0.20	Low	0.0-1.0	.43	.43			
	32-53	18-25	1.20-1.35	0.2-0.6	0.17-0.20	Low	0.0-0.5	.43	.43			
	53-80	18-25	1.20-1.35	0.06-2	0.17-0.20	Low	0.0-0.5	.43	.43			
Zell-----	0-7	10-18	1.15-1.30	0.6-2	0.19-0.22	Low	1.0-3.0	.32	.32	5	4L	86
	7-31	10-18	1.25-1.40	0.6-2	0.15-0.20	Low	0.0-1.0	.43	.43			
	31-80	5-18	1.25-1.40	0.06-2	0.15-0.20	Low	0.0-0.5	.43	.43			
Huffton-----	0-7	10-18	1.15-1.30	0.6-2	0.20-0.22	Low	1.0-3.0	.37	.37	5	4L	86
	7-28	15-30	1.20-1.35	0.6-2	0.12-0.17	Moderate	1.0-3.0	.37	.37			
	28-80	10-25	1.20-1.35	0.06-2	0.15-0.20	Low	0.0-0.5	.43	.43			
HaA:												
Hamerly-----	0-9	18-27	1.30-1.60	0.6-2	0.18-0.24	Moderate	3.0-4.0	.24	.24	5	4L	86
	9-29	18-35	1.20-1.60	0.6-2	0.15-0.19	Moderate	1.0-3.0	.28	.28			
	29-80	18-35	1.30-1.60	0.2-0.6	0.14-0.19	Moderate	0.0-0.5	.37	.37			
Hb:												
Hamerly-----	0-9	18-27	1.30-1.60	0.6-2	0.18-0.24	Moderate	3.0-4.0	.24	.24	5	4L	86
	9-29	18-35	1.20-1.60	0.6-2	0.15-0.19	Moderate	1.0-3.0	.28	.28			
	29-80	18-35	1.30-1.60	0.2-0.6	0.14-0.19	Moderate	0.0-0.5	.37	.37			
Tonka-----	0-16	18-27	1.10-1.30	0.6-2	0.20-0.24	Low	5.0-10	.37	.37	5	6	48
	16-41	35-50	1.40-1.65	0.06-0.2	0.14-0.20	High	1.0-3.0	.43	.43			
	41-80	27-39	1.40-1.70	0.2-2	0.14-0.19	Moderate	0.0-1.0	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
HcA:												
Hand-----	0-7	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	2.0-4.0	.28	.28	5	6	48
	7-18	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	1.0-3.0	.28	.28			
	18-35	18-30	1.20-1.35	0.6-2	0.18-0.22	Moderate	0.5-2.0	.28	.28			
	35-80	18-30	1.25-1.40	0.6-2	0.12-0.18	Moderate	0.0-0.5	.28	.28			
Bonilla-----	0-8	20-27	1.15-1.30	0.6-2	0.17-0.19	Low	4.0-6.0	.24	.24	5	6	48
	8-27	18-30	1.20-1.35	0.6-2	0.18-0.22	Moderate	0.5-2.0	.28	.28			
	27-47	18-30	1.25-1.35	0.2-2	0.16-0.20	Moderate	0.0-1.0	.32	.32			
	47-80	18-30	1.25-1.35	0.2-2	0.16-0.20	Moderate	0.0-0.5	.37	.37			
HcB:												
Hand-----	0-7	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	2.0-4.0	.28	.28	5	6	48
	7-18	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	1.0-3.0	.28	.28			
	18-35	18-30	1.20-1.35	0.6-2	0.18-0.22	Moderate	0.5-2.0	.28	.28			
	35-80	18-30	1.25-1.40	0.6-2	0.12-0.18	Moderate	0.0-0.5	.28	.28			
Bonilla-----	0-8	20-27	1.15-1.30	0.6-2	0.17-0.19	Low	4.0-6.0	.24	.24	5	6	48
	8-27	18-30	1.20-1.35	0.6-2	0.18-0.22	Moderate	0.5-2.0	.28	.28			
	27-47	18-30	1.25-1.35	0.2-2	0.16-0.20	Moderate	0.0-1.0	.32	.32			
	47-80	18-30	1.25-1.35	0.2-2	0.16-0.20	Moderate	0.0-0.5	.37	.37			
HdA:												
Hand-----	0-7	10-20	1.25-1.35	2-6	0.14-0.17	Low	1.0-3.0	.20	.20	5	3	86
	7-18	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	1.0-3.0	.28	.28			
	18-35	18-30	1.20-1.35	0.6-2	0.18-0.22	Moderate	0.5-2.0	.28	.28			
	35-80	18-30	1.25-1.40	0.6-2	0.12-0.18	Moderate	0.0-0.5	.28	.28			
Carthage-----	0-7	15-20	1.25-1.35	2-6	0.11-0.17	Low	2.0-4.0	.20	.20	5	3	86
	7-24	10-18	1.25-1.35	2-6	0.11-0.17	Low	1.0-3.0	.20	.20			
	24-80	20-30	1.45-1.65	0.2-0.6	0.16-0.20	Moderate	0.0-0.5	.37	.37			
He:												
Hand-----	0-7	10-20	1.25-1.35	2-6	0.14-0.17	Low	1.0-3.0	.20	.20	5	3	86
	7-18	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	1.0-3.0	.28	.28			
	18-35	18-30	1.20-1.35	0.6-2	0.18-0.22	Moderate	0.5-2.0	.28	.28			
	35-80	18-30	1.25-1.40	0.6-2	0.12-0.18	Moderate	0.0-0.5	.28	.28			
Carthage-----	0-7	15-20	1.25-1.35	2-6	0.11-0.17	Low	2.0-4.0	.20	.20	5	3	86
	7-24	10-18	1.25-1.35	2-6	0.11-0.17	Low	1.0-3.0	.20	.20			
	24-80	20-30	1.45-1.65	0.2-0.6	0.16-0.20	Moderate	0.0-0.5	.37	.37			
Overshue-----	0-7	10-18	1.20-1.50	0.6-2	0.13-0.18	Low	4.0-8.0	.20	.20	5	3	86
	7-42	5-18	1.40-1.60	0.6-6	0.10-0.15	Low	0.0-2.0	.24	.24			
	42-80	20-30	1.45-1.65	0.2-0.6	0.16-0.20	Moderate	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
HfC:												
Hand-----	0-7	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	2.0-4.0	.28	.28	5	6	48
	7-18	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	1.0-3.0	.28	.28			
	18-35	18-30	1.20-1.35	0.6-2	0.18-0.22	Moderate	0.5-2.0	.28	.28			
	35-80	18-30	1.25-1.40	0.6-2	0.12-0.18	Moderate	0.0-0.5	.28	.28			
Ethan-----	0-8	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	1.0-3.0	.28	.28	5	4L	86
	8-20	18-30	1.30-1.45	0.6-2	0.16-0.20	Moderate	0.5-1.0	.32	.32			
	20-32	18-30	1.45-1.70	0.6-2	0.16-0.20	Moderate	0.0-0.5	.37	.43			
	32-60	18-30	1.45-1.70	0.2-2	0.16-0.20	Moderate	0.0-0.5	.37	.43			
HgB:												
Hand-----	0-7	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	2.0-4.0	.28	.28	5	6	48
	7-18	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	1.0-3.0	.28	.28			
	18-35	18-30	1.20-1.35	0.6-2	0.18-0.22	Moderate	0.5-2.0	.28	.28			
	35-80	18-30	1.25-1.40	0.6-2	0.12-0.18	Moderate	0.0-0.5	.28	.28			
Ethan-----	0-8	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	1.0-3.0	.28	.28	5	4L	86
	8-20	18-30	1.30-1.45	0.6-2	0.16-0.20	Moderate	0.5-1.0	.32	.32			
	20-32	18-30	1.45-1.70	0.6-2	0.16-0.20	Moderate	0.0-0.5	.37	.43			
	32-60	18-30	1.45-1.70	0.2-2	0.16-0.20	Moderate	0.0-0.5	.37	.43			
Bonilla-----	0-8	20-27	1.15-1.30	0.6-2	0.17-0.19	Low	4.0-6.0	.24	.24	5	6	48
	8-27	18-30	1.20-1.35	0.6-2	0.18-0.22	Moderate	0.5-2.0	.28	.28			
	27-47	18-30	1.25-1.35	0.2-2	0.16-0.20	Moderate	0.0-1.0	.32	.32			
	47-80	18-30	1.25-1.35	0.2-2	0.16-0.20	Moderate	0.0-0.5	.37	.37			
HgC:												
Hand-----	0-7	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	2.0-4.0	.28	.28	5	6	48
	7-18	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	1.0-3.0	.28	.28			
	18-35	18-30	1.20-1.35	0.6-2	0.18-0.22	Moderate	0.5-2.0	.28	.28			
	35-80	18-30	1.25-1.40	0.6-2	0.12-0.18	Moderate	0.0-0.5	.28	.28			
Ethan-----	0-8	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	1.0-3.0	.28	.28	5	4L	86
	8-20	18-30	1.30-1.45	0.6-2	0.16-0.20	Moderate	0.5-1.0	.32	.32			
	20-32	18-30	1.45-1.70	0.6-2	0.16-0.20	Moderate	0.0-0.5	.37	.43			
	32-60	18-30	1.45-1.70	0.2-2	0.16-0.20	Moderate	0.0-0.5	.37	.43			
Bonilla-----	0-8	20-27	1.15-1.30	0.6-2	0.17-0.19	Low	4.0-6.0	.24	.24	5	6	48
	8-27	18-30	1.20-1.35	0.6-2	0.18-0.22	Moderate	0.5-2.0	.28	.28			
	27-47	18-30	1.25-1.35	0.2-2	0.16-0.20	Moderate	0.0-1.0	.32	.32			
	47-80	18-30	1.25-1.35	0.2-2	0.16-0.20	Moderate	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
HhB:												
Hand-----	0-7	10-20	1.25-1.35	2-6	0.14-0.17	Low	1.0-3.0	.20	.20	5	3	86
	7-18	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	1.0-3.0	.28	.28			
	18-35	18-30	1.20-1.35	0.6-2	0.18-0.22	Moderate	0.5-2.0	.28	.28			
	35-80	18-30	1.25-1.40	0.6-2	0.12-0.18	Moderate	0.0-0.5	.28	.28			
Ethan-----	0-8	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	1.0-3.0	.28	.28	5	4L	86
	8-20	18-30	1.30-1.45	0.6-2	0.16-0.20	Moderate	0.5-1.0	.32	.32			
	20-32	18-30	1.45-1.70	0.6-2	0.16-0.20	Moderate	0.0-0.5	.37	.43			
	32-60	18-30	1.45-1.70	0.2-2	0.16-0.20	Moderate	0.0-0.5	.37	.43			
Carthage-----	0-7	15-20	1.25-1.35	2-6	0.11-0.17	Low	2.0-4.0	.20	.20	5	3	86
	7-24	10-18	1.25-1.35	2-6	0.11-0.17	Low	1.0-3.0	.20	.20			
	24-80	20-30	1.45-1.65	0.2-0.6	0.16-0.20	Moderate	0.0-0.5	.37	.37			
HjB:												
Hand-----	0-7	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	2.0-4.0	.28	.28	5	6	48
	7-18	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	1.0-3.0	.28	.28			
	18-35	18-30	1.20-1.35	0.6-2	0.18-0.22	Moderate	0.5-2.0	.28	.28			
	35-80	18-30	1.25-1.40	0.6-2	0.12-0.18	Moderate	0.0-0.5	.28	.28			
Talmo-----	0-7	18-25	1.20-1.45	0.6-2	0.18-0.20	Low	1.0-3.0	.20	.28	2	5	56
	7-80	0-10	1.45-1.65	6-60	0.03-0.06	Low	0.0-0.5	.05	.15			
HjC:												
Hand-----	0-7	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	2.0-4.0	.28	.28	5	6	48
	7-18	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	1.0-3.0	.28	.28			
	18-35	18-30	1.20-1.35	0.6-2	0.18-0.22	Moderate	0.5-2.0	.28	.28			
	35-80	18-30	1.25-1.40	0.6-2	0.12-0.18	Moderate	0.0-0.5	.28	.28			
Talmo-----	0-7	18-25	1.20-1.45	0.6-2	0.18-0.20	Low	1.0-3.0	.20	.28	2	5	56
	7-80	0-10	1.45-1.65	6-60	0.03-0.06	Low	0.0-0.5	.05	.15			
Hk:												
Harmony-----	0-8	20-26	1.15-1.25	0.6-2	0.19-0.22	Low	4.0-8.0	.37	.37	5	6	48
	8-34	35-50	1.25-1.45	0.2-0.6	0.13-0.18	High	0.5-4.0	.37	.37			
	34-50	10-30	1.30-1.40	0.06-2	0.11-0.20	Moderate	0.0-0.5	.43	.43			
	50-80	25-30	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
Aberdeen-----	0-11	20-26	1.10-1.25	0.6-2	0.19-0.22	Moderate	3.0-4.0	.37	.37	5	6	48
	11-23	35-55	1.20-1.35	0.06-0.2	0.13-0.18	High	1.0-4.0	.37	.37			
	23-36	30-55	1.20-1.35	0.06-0.2	0.14-0.17	High	1.0-4.0	.37	.37			
	36-49	10-30	1.25-1.40	0.06-2	0.14-0.17	Moderate	0.0-1.0	.43	.43			
	49-80	25-30	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
Hm:												
Harmony-----	0-11	27-34	1.15-1.25	0.6-2	0.19-0.22	Moderate	4.0-8.0	.37	.37	5	7	38
	11-25	35-50	1.25-1.45	0.2-0.6	0.13-0.18	High	0.5-4.0	.37	.37			
	25-80	10-30	1.30-1.40	0.06-2	0.11-0.20	Moderate	0.0-0.5	.43	.43			
Aberdeen-----	0-13	27-33	1.15-1.25	0.2-0.6	0.19-0.22	Moderate	3.0-4.0	.37	.37	5	7	38
	13-23	35-55	1.20-1.35	0.06-0.2	0.13-0.18	High	1.0-4.0	.37	.37			
	23-39	30-55	1.20-1.35	0.06-0.2	0.14-0.17	High	0.0-2.0	.37	.37			
	39-80	10-26	1.25-1.40	0.06-2	0.14-0.17	Low	0.0-1.0	.43	.43			
Hn:												
Harmony-----	0-11	20-26	1.15-1.25	0.6-2	0.19-0.22	Low	4.0-8.0	.37	.37	5	6	48
	11-25	35-50	1.25-1.45	0.2-0.6	0.13-0.18	High	0.5-4.0	.37	.37			
	25-80	10-30	1.30-1.40	0.06-2	0.11-0.20	Moderate	0.0-0.5	.43	.43			
Beotia-----	0-9	20-27	1.10-1.25	0.6-2	0.19-0.22	Low	4.0-8.0	.28	.28	5	6	48
	9-21	18-30	1.15-1.30	0.6-2	0.19-0.22	Moderate	2.0-4.0	.32	.32			
	21-39	18-30	1.20-1.35	0.2-2	0.17-0.20	Moderate	0.5-2.0	.37	.37			
	39-80	18-35	1.20-1.35	0.06-2	0.17-0.20	Moderate	0.0-0.5	.43	.43			
Ho:												
Harmony-----	0-8	20-26	1.15-1.25	0.6-2	0.19-0.22	Low	4.0-8.0	.37	.37	5	6	48
	8-34	35-50	1.25-1.45	0.2-0.6	0.13-0.18	High	0.5-4.0	.37	.37			
	34-50	10-30	1.30-1.40	0.06-2	0.11-0.20	Moderate	0.0-0.5	.43	.43			
	50-80	25-30	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
Beotia-----	0-12	20-27	1.10-1.25	0.6-2	0.19-0.22	Low	4.0-8.0	.28	.28	5	6	48
	12-27	18-30	1.15-1.30	0.6-2	0.19-0.22	Moderate	2.0-4.0	.32	.32			
	27-46	18-30	1.20-1.35	0.2-2	0.17-0.20	Moderate	1.0-3.0	.37	.37			
	46-52	18-35	1.20-1.35	0.06-2	0.17-0.20	Moderate	0.0-0.5	.43	.43			
	52-80	25-30	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
Hp:												
Harriet-----	0-2	12-25	1.10-1.40	0.6-2	0.18-0.22	Low	3.0-6.0	.32	.32	2	6	48
	2-17	35-50	1.20-1.60	0.01-0.06	0.10-0.15	High	1.0-3.0	.37	.37			
	17-42	18-40	1.20-1.60	0.6-2	0.10-0.15	Moderate	0.5-1.0	.37	.37			
	42-80	18-45	1.20-1.60	0.06-0.2	0.10-0.15	Moderate	0.0-0.5	.37	.37			
Hr:												
Heil-----	0-2	18-27	1.20-1.40	0.6-2	0.15-0.24	Moderate	3.0-6.0	.37	.37	2	6	48
	2-24	45-60	1.20-1.55	0.01-0.06	0.13-0.18	High	0.0-1.0	.37	.37			
	24-80	27-50	1.20-1.70	0.06-0.2	0.13-0.18	High	0.0-0.5	.32	.32			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
HsA:												
Henkin-----	0-7	10-20	1.25-1.35	2-6	0.11-0.17	Low	1.0-3.0	.20	.20	5	3	86
	7-35	7-18	1.20-1.45	2-6	0.09-0.18	Low	1.0-3.0	.20	.20			
	35-46	7-18	1.25-1.60	2-6	0.09-0.15	Low	0.0-1.0	.24	.24			
	46-80	3-27	1.35-1.65	0.6-6	0.08-0.16	Low	0.0-0.5	.24	.24			
Blendon-----	0-9	10-18	1.25-1.35	2-6	0.11-0.17	Low	2.0-4.0	.20	.20	5	3	86
	9-36	10-20	1.20-1.30	2-6	0.11-0.18	Low	1.0-2.0	.20	.20			
	36-48	10-15	1.25-1.35	2-6	0.09-0.15	Low	0.0-1.0	.24	.24			
	48-80	5-18	1.30-1.45	2-20	0.08-0.15	Low	0.0-0.5	.24	.24			
HsB:												
Henkin-----	0-7	10-20	1.25-1.35	2-6	0.11-0.17	Low	1.0-3.0	.20	.20	5	3	86
	7-35	7-18	1.20-1.45	2-6	0.09-0.18	Low	1.0-3.0	.20	.20			
	35-46	7-18	1.25-1.60	2-6	0.09-0.15	Low	0.0-1.0	.24	.24			
	46-80	3-27	1.35-1.65	0.6-6	0.08-0.16	Low	0.0-0.5	.24	.24			
Blendon-----	0-9	10-18	1.25-1.35	2-6	0.11-0.17	Low	2.0-4.0	.20	.20	5	3	86
	9-36	10-20	1.20-1.30	2-6	0.11-0.18	Low	1.0-2.0	.20	.20			
	36-48	10-15	1.25-1.35	2-6	0.09-0.15	Low	0.0-1.0	.24	.24			
	48-80	5-18	1.30-1.45	2-20	0.08-0.15	Low	0.0-0.5	.24	.24			
HtB:												
Houdek-----	0-6	15-26	1.20-1.30	0.6-2	0.18-0.20	Low	2.0-4.0	.24	.24	5	6	48
	6-19	27-35	1.25-1.35	0.6-2	0.16-0.22	Moderate	1.0-3.0	.28	.28			
	19-42	25-35	1.25-1.40	0.6-2	0.17-0.20	Moderate	0.5-2.0	.28	.28			
	42-80	20-30	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
Ethan-----	0-8	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	1.0-3.0	.28	.28	5	4L	86
	8-20	18-30	1.30-1.45	0.6-2	0.16-0.20	Moderate	0.5-1.0	.32	.32			
	20-32	18-30	1.45-1.70	0.6-2	0.16-0.20	Moderate	0.0-0.5	.37	.43			
	32-60	18-30	1.45-1.70	0.2-2	0.16-0.20	Moderate	0.0-0.5	.37	.43			
Prosper-----	0-8	18-26	1.15-1.25	0.6-2	0.17-0.19	Low	4.0-6.0	.24	.24	5	6	48
	8-30	27-35	1.20-1.30	0.6-2	0.19-0.22	Moderate	1.0-3.0	.28	.28			
	30-39	20-30	1.30-1.60	0.6-2	0.17-0.20	Moderate	0.0-2.0	.28	.28			
	39-80	20-30	1.45-1.65	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
HtC:												
Houdek-----	0-6	15-26	1.20-1.30	0.6-2	0.18-0.20	Low	2.0-4.0	.24	.24	5	6	48
	6-19	27-35	1.25-1.35	0.6-2	0.16-0.22	Moderate	1.0-3.0	.28	.28			
	19-42	25-35	1.25-1.40	0.6-2	0.17-0.20	Moderate	0.5-2.0	.28	.28			
	42-80	20-30	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
HtC: (cont.)												
Ethan-----	0-8	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	1.0-3.0	.28	.28	5	4L	86
	8-20	18-30	1.30-1.45	0.6-2	0.16-0.20	Moderate	0.5-1.0	.32	.32			
	20-32	18-30	1.45-1.70	0.6-2	0.16-0.20	Moderate	0.0-0.5	.37	.43			
	32-60	18-30	1.45-1.70	0.2-2	0.16-0.20	Moderate	0.0-0.5	.37	.43			
Prosper-----	0-8	18-26	1.15-1.25	0.6-2	0.17-0.19	Low	4.0-6.0	.24	.24	5	6	48
	8-30	27-35	1.20-1.30	0.6-2	0.19-0.22	Moderate	1.0-3.0	.28	.28			
	30-39	20-30	1.30-1.60	0.6-2	0.17-0.20	Moderate	0.0-2.0	.28	.28			
	39-80	20-30	1.45-1.65	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
HuA:												
Houdek-----	0-6	15-26	1.20-1.30	0.6-2	0.18-0.20	Low	2.0-4.0	.24	.24	5	6	48
	6-19	27-35	1.25-1.35	0.6-2	0.16-0.22	Moderate	1.0-3.0	.28	.28			
	19-42	25-35	1.25-1.40	0.6-2	0.17-0.20	Moderate	0.5-2.0	.28	.28			
	42-80	20-30	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
Prosper-----	0-8	18-26	1.15-1.25	0.6-2	0.17-0.19	Low	4.0-6.0	.24	.24	5	6	48
	8-30	27-35	1.20-1.30	0.6-2	0.19-0.22	Moderate	1.0-3.0	.28	.28			
	30-39	20-30	1.30-1.60	0.6-2	0.17-0.20	Moderate	0.0-2.0	.28	.28			
	39-80	20-30	1.45-1.65	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
HuB:												
Houdek-----	0-6	15-26	1.20-1.30	0.6-2	0.18-0.20	Low	2.0-4.0	.24	.24	5	6	48
	6-19	27-35	1.25-1.35	0.6-2	0.16-0.22	Moderate	1.0-3.0	.28	.28			
	19-42	25-35	1.25-1.40	0.6-2	0.17-0.20	Moderate	0.5-2.0	.28	.28			
	42-80	20-30	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
Prosper-----	0-8	18-26	1.15-1.25	0.6-2	0.17-0.19	Low	4.0-6.0	.24	.24	5	6	48
	8-30	27-35	1.20-1.30	0.6-2	0.19-0.22	Moderate	1.0-3.0	.28	.28			
	30-39	20-30	1.30-1.60	0.6-2	0.17-0.20	Moderate	0.0-2.0	.28	.28			
	39-80	20-30	1.45-1.65	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
HwA:												
Houdek-----	0-6	15-26	1.20-1.30	0.6-2	0.18-0.20	Low	2.0-4.0	.24	.24	5	6	48
	6-19	27-35	1.25-1.35	0.6-2	0.16-0.22	Moderate	1.0-3.0	.28	.28			
	19-42	25-35	1.25-1.40	0.6-2	0.17-0.20	Moderate	0.5-2.0	.28	.28			
	42-80	20-30	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
Stickney-----	0-10	20-27	1.15-1.30	0.6-2	0.20-0.22	Low	2.0-4.0	.37	.37	5	6	48
	10-22	35-45	1.20-1.35	0.06-0.2	0.16-0.19	High	0.0-2.0	.37	.37			
	22-80	20-35	1.50-1.70	0.06-0.6	0.14-0.18	Moderate	0.0-1.0	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
HxA:												
Houdek-----	0-6	15-26	1.20-1.30	0.6-2	0.18-0.20	Low	2.0-4.0	.24	.24	5	6	48
	6-19	27-35	1.25-1.35	0.6-2	0.16-0.22	Moderate	1.0-3.0	.28	.28			
	19-42	25-35	1.25-1.40	0.6-2	0.17-0.20	Moderate	0.5-2.0	.28	.28			
	42-80	20-30	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
Stickney-----	0-10	20-27	1.15-1.30	0.6-2	0.20-0.22	Low	2.0-4.0	.37	.37	5	6	48
	10-22	35-45	1.20-1.35	0.06-0.2	0.16-0.19	High	0.0-2.0	.37	.37			
	22-80	20-35	1.50-1.70	0.06-0.6	0.14-0.18	Moderate	0.0-1.0	.37	.37			
Tetonka-----	0-13	20-27	1.10-1.25	0.6-2	0.19-0.22	Moderate	4.0-8.0	.37	.37	5	6	48
	13-39	35-60	1.20-1.35	0.06-0.2	0.13-0.19	High	1.0-3.0	.28	.28			
	39-80	30-50	1.35-1.50	0.06-0.6	0.11-0.17	High	0.0-1.0	.32	.32			
Hy:												
Hoven-----	0-3	22-26	1.15-1.25	0.6-2	0.19-0.22	Low	2.0-4.0	.37	.37	2	6	48
	3-6	35-60	1.15-1.30	0.01-0.06	0.10-0.19	High	1.0-2.0	.37	.37			
	6-22	35-60	1.15-1.30	0.01-0.06	0.10-0.19	High	1.0-2.0	.37	.37			
	22-80	35-60	1.30-1.50	0.06-0.2	0.08-0.17	High	0.0-1.0	.37	.37			
Ie:												
Ipage-----	0-6	1-5	1.40-1.50	6-20	0.07-0.09	Low	0.5-1.0	.15	.15	5	1	220
	6-61	1-8	1.50-1.60	6-20	0.04-0.10	Low	0.0-1.0	.15	.15			
	61-80	20-30	1.50-1.70	0.2-0.6	0.15-0.20	Moderate	0.0-0.5	.32	.32			
Els-----	0-7	2-8	1.60-1.70	6-20	0.07-0.12	Low	0.5-3.0	.15	.15	5	1	220
	7-49	0-8	1.50-1.60	6-20	0.05-0.08	Low	0.0-0.5	.15	.15			
	49-80	20-30	1.50-1.70	0.2-0.6	0.15-0.20	Moderate	0.0-0.5	.32	.32			
Shue-----	0-8	5-10	1.15-1.30	6-20	0.10-0.12	Low	1.0-3.0	.17	.17	5	2	134
	8-26	5-10	1.35-1.60	6-20	0.06-0.10	Low	0.5-1.0	.17	.17			
	26-80	20-30	1.45-1.65	0.2-0.6	0.16-0.20	Moderate	0.0-0.5	.37	.37			
Jh:												
Jerauld-----	0-2	15-25	1.10-1.25	0.6-2	0.18-0.22	Low	1.0-3.0	.37	.37	2	6	48
	2-14	35-60	1.15-1.30	0.001-0.06	0.10-0.15	High	1.0-2.0	.37	.37			
	14-33	35-60	1.15-1.30	0.06-0.2	0.10-0.15	High	0.0-2.0	.37	.37			
	33-80	27-45	1.35-1.60	0.06-0.2	0.08-0.13	High	0.0-0.5	.32	.32			
Hoven-----	0-3	22-26	1.15-1.25	0.6-2	0.19-0.22	Low	2.0-4.0	.37	.37	2	6	48
	3-6	35-60	1.15-1.30	0.01-0.06	0.10-0.19	High	1.0-2.0	.37	.37			
	6-22	35-60	1.15-1.30	0.01-0.06	0.10-0.19	High	1.0-2.0	.37	.37			
	22-80	35-60	1.30-1.50	0.06-0.2	0.08-0.17	High	0.0-1.0	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
KaA:												
Kranzburg-----	0-7	24-26	1.10-1.25	0.6-2	0.19-0.22	Low	3.0-5.0	.28	.28	5	6	48
	7-14	24-34	1.20-1.35	0.6-2	0.18-0.21	Moderate	1.0-4.0	.32	.32			
	14-26	24-34	1.20-1.35	0.6-2	0.18-0.22	Moderate	1.0-4.0	.32	.32			
	26-48	25-30	1.50-1.70	0.2-0.6	0.18-0.20	Moderate	0.5-2.0	.37	.37			
	48-80	25-30	1.50-1.70	0.2-0.6	0.18-0.20	Moderate	0.0-1.0	.37	.37			
Brookings -----	0-15	20-27	1.10-1.25	0.6-2	0.19-0.22	Low	4.0-8.0	.28	.28	5	6	48
	15-26	25-35	1.20-1.35	0.6-2	0.19-0.22	Moderate	1.0-5.0	.32	.32			
	26-35	25-35	1.20-1.35	0.6-2	0.17-0.20	Moderate	0.5-1.0	.32	.32			
	35-80	20-35	1.50-1.70	0.2-2	0.16-0.20	Moderate	0.0-1.0	.37	.37			
KbB:												
Kranzburg-----	0-7	24-26	1.10-1.25	0.6-2	0.19-0.22	Low	3.0-5.0	.28	.28	5	6	48
	7-14	24-34	1.20-1.35	0.6-2	0.18-0.21	Moderate	1.0-4.0	.32	.32			
	14-26	24-34	1.20-1.35	0.6-2	0.18-0.22	Moderate	1.0-4.0	.32	.32			
	26-48	25-30	1.50-1.70	0.2-0.6	0.18-0.20	Moderate	0.5-2.0	.37	.37			
	48-80	25-30	1.50-1.70	0.2-0.6	0.18-0.20	Moderate	0.0-1.0	.37	.37			
Brookings -----	0-15	20-27	1.10-1.25	0.6-2	0.19-0.22	Low	4.0-8.0	.28	.28	5	6	48
	15-26	25-35	1.20-1.35	0.6-2	0.19-0.22	Moderate	1.0-5.0	.32	.32			
	26-35	25-35	1.20-1.35	0.6-2	0.17-0.20	Moderate	0.5-1.0	.32	.32			
	35-80	20-35	1.50-1.70	0.2-2	0.16-0.20	Moderate	0.0-1.0	.37	.37			
Buse -----	0-7	18-27	1.40-1.50	0.2-0.6	0.17-0.22	Low	1.0-3.0	.28	.28	5	4L	86
	7-35	18-35	1.55-1.65	0.2-0.6	0.14-0.19	Moderate	0.5-1.0	.37	.37			
	35-80	18-35	1.55-1.65	0.2-0.6	0.14-0.19	Moderate	0.0-0.5	.37	.37			
KcA:												
Kranzburg-----	0-7	24-26	1.10-1.25	0.6-2	0.19-0.22	Low	3.0-5.0	.28	.28	5	6	48
	7-14	24-34	1.20-1.35	0.6-2	0.18-0.21	Moderate	1.0-4.0	.32	.32			
	14-26	24-34	1.20-1.35	0.6-2	0.18-0.22	Moderate	1.0-4.0	.32	.32			
	26-48	25-30	1.50-1.70	0.2-0.6	0.18-0.20	Moderate	0.5-2.0	.37	.37			
	48-80	25-30	1.50-1.70	0.2-0.6	0.18-0.20	Moderate	0.0-1.0	.37	.37			
Cresbard -----	0-8	20-26	1.10-1.25	0.6-2	0.18-0.21	Low	2.0-5.0	.37	.37	5	6	48
	8-11	27-40	1.20-1.35	0.2-0.6	0.14-0.17	Moderate	1.0-3.0	.32	.32			
	11-22	35-50	1.20-1.35	0.06-0.6	0.11-0.14	High	0.0-2.0	.32	.32			
	22-38	35-50	1.20-1.35	0.06-0.6	0.11-0.15	High	0.0-0.5	.37	.37			
	38-80	25-35	1.40-1.60	0.2-0.6	0.16-0.20	Moderate	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
KtA:												
Kranzburg-----	0-7	24-26	1.10-1.25	0.6-2	0.19-0.22	Low	3.0-5.0	.28	.28	5	6	48
	7-14	24-34	1.20-1.35	0.6-2	0.18-0.21	Moderate	1.0-4.0	.32	.32			
	14-26	24-34	1.20-1.35	0.6-2	0.18-0.22	Moderate	1.0-4.0	.32	.32			
	26-48	25-30	1.50-1.70	0.2-0.6	0.18-0.20	Moderate	0.5-2.0	.37	.37			
	48-80	25-30	1.50-1.70	0.2-0.6	0.18-0.20	Moderate	0.0-1.0	.37	.37			
Cresbard-----	0-8	20-26	1.10-1.25	0.6-2	0.18-0.21	Low	2.0-5.0	.37	.37	5	6	48
	8-11	27-40	1.20-1.35	0.2-0.6	0.14-0.17	Moderate	1.0-3.0	.32	.32			
	11-22	35-50	1.20-1.35	0.06-0.6	0.11-0.14	High	0.0-2.0	.32	.32			
	22-38	35-50	1.20-1.35	0.06-0.6	0.11-0.15	High	0.0-0.5	.37	.37			
	38-80	25-35	1.40-1.60	0.2-0.6	0.16-0.20	Moderate	0.0-0.5	.37	.37			
Tonka-----	0-16	18-27	1.10-1.30	0.6-2	0.20-0.24	Low	5.0-10	.37	.37	5	6	48
	16-41	35-50	1.40-1.65	0.06-0.2	0.14-0.20	High	1.0-3.0	.43	.43			
	41-80	27-39	1.40-1.70	0.2-2	0.14-0.19	Moderate	0.0-1.0	.37	.37			
KzB:												
Kranzburg-----	0-7	24-26	1.10-1.25	0.6-2	0.19-0.22	Low	3.0-5.0	.28	.28	5	6	48
	7-14	24-34	1.20-1.35	0.6-2	0.18-0.21	Moderate	1.0-4.0	.32	.32			
	14-26	24-34	1.20-1.35	0.6-2	0.18-0.22	Moderate	1.0-4.0	.32	.32			
	26-48	25-30	1.50-1.70	0.2-0.6	0.18-0.20	Moderate	0.5-2.0	.37	.37			
	48-80	25-30	1.50-1.70	0.2-0.6	0.18-0.20	Moderate	0.0-1.0	.37	.37			
Zell-----	0-7	10-18	1.15-1.30	0.6-2	0.19-0.22	Low	1.0-3.0	.32	.32	5	4L	86
	7-31	10-18	1.25-1.40	0.6-2	0.15-0.20	Low	0.0-1.0	.43	.43			
	31-80	5-18	1.25-1.40	0.06-2	0.15-0.20	Low	0.0-0.5	.43	.43			
Aastad-----	0-14	24-27	1.35-1.45	0.6-2	0.18-0.20	Moderate	4.0-6.0	.24	.24	5	6	48
	14-29	28-35	1.45-1.60	0.2-0.6	0.15-0.19	Moderate	2.0-5.0	.28	.28			
	29-80	24-35	1.55-1.65	0.2-0.6	0.14-0.16	Moderate	0.0-0.5	.37	.37			
La:												
La Prairie-----	0-13	18-27	1.10-1.40	0.6-2	0.17-0.22	Low	2.0-6.0	.24	.24	5	6	48
	13-33	18-35	1.10-1.50	0.6-2	0.17-0.22	Moderate	1.0-4.0	.28	.28			
	33-44	18-35	1.30-1.70	0.6-2	0.15-0.22	Moderate	0.0-2.0	.28	.28			
	44-80	18-30	1.30-1.70	0.6-2	0.15-0.22	Moderate	0.0-2.0	.28	.28			
Lc:												
La Prairie, channeled-----	0-13	18-27	1.10-1.40	0.6-2	0.17-0.22	Low	2.0-6.0	.24	.24	5	6	48
	13-33	18-35	1.10-1.50	0.6-2	0.17-0.22	Moderate	1.0-4.0	.28	.28			
	33-44	18-35	1.30-1.70	0.6-2	0.15-0.22	Moderate	0.0-2.0	.28	.28			
	44-80	18-30	1.30-1.70	0.6-2	0.15-0.22	Moderate	0.0-2.0	.28	.28			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
Lc: (cont.) Holmquist, channeled-----	0-7	18-27	1.20-1.30	0.6-2	0.18-0.20	Low	3.0-6.0	.24	.24	5	4L	86
	7-80	10-35	1.30-1.60	0.6-2	0.12-0.20	Moderate	0.0-0.5	.28	.28			
Ld: LaDelle-----	0-19	20-27	1.15-1.30	0.6-2	0.20-0.22	Low	3.0-7.0	.28	.28	5	6	48
	19-48	25-35	1.20-1.35	0.6-2	0.18-0.22	Moderate	0.5-2.0	.32	.32			
	48-80	25-35	1.30-1.40	0.6-2	0.18-0.22	Moderate	0.0-0.5	.28	.28			
Le: LaDelle, channeled----	0-19	20-27	1.15-1.30	0.6-2	0.20-0.22	Low	3.0-7.0	.28	.28	5	6	48
	19-48	25-35	1.20-1.35	0.6-2	0.18-0.22	Moderate	0.5-2.0	.32	.32			
	48-80	25-35	1.30-1.40	0.6-2	0.18-0.22	Moderate	0.0-0.5	.28	.28			
Lk: Lamo-----	0-22	18-35	1.30-1.60	0.2-2	0.19-0.23	Moderate	1.0-3.0	.32	.32	5	4L	86
	22-80	25-35	1.30-1.50	0.2-0.6	0.18-0.22	Moderate	0.5-1.0	.43	.43			
Lm: Lamoure-----	0-19	27-34	1.15-1.25	0.2-2	0.19-0.22	Moderate	4.0-8.0	.28	.28	5	4L	86
	19-38	25-34	1.20-1.35	0.2-2	0.17-0.20	Moderate	1.0-3.0	.32	.32			
	38-55	25-34	1.20-1.35	0.2-2	0.17-0.20	Moderate	0.5-1.0	.43	.43			
	55-80	20-34	1.25-1.40	0.2-2	0.09-0.18	Low	0.0-0.5	.28	.28			
Ln: Lawet-----	0-8	15-27	1.30-1.50	0.6-2	0.20-0.24	Low	3.0-6.0	.24	.24	5	4L	86
	8-51	15-35	1.30-1.50	0.2-2	0.14-0.19	Moderate	0.5-2.0	.28	.28			
	51-80	0-15	1.50-1.80	2-20	0.05-0.13	Low	0.0-0.5	.17	.17			
Lo: Lawet, wet-----	0-8	15-27	1.30-1.50	0.6-2	0.20-0.24	Low	3.0-6.0	.24	.24	5	4L	86
	8-51	15-35	1.30-1.50	0.2-2	0.14-0.19	Moderate	0.5-2.0	.28	.28			
	51-80	0-15	1.50-1.80	2-20	0.05-0.13	Low	0.0-0.5	.17	.17			
Lp: Lawet-----	0-8	15-27	1.30-1.50	0.6-2	0.20-0.24	Low	3.0-6.0	.24	.24	5	4L	86
	8-51	15-35	1.30-1.50	0.2-2	0.14-0.19	Moderate	0.5-2.0	.28	.28			
	51-80	0-15	1.50-1.80	2-20	0.05-0.13	Low	0.0-0.5	.17	.17			
Davison-----	0-8	18-26	1.20-1.30	0.6-2	0.18-0.20	Low	2.0-6.0	.28	.28	5	4L	86
	8-28	18-30	1.20-1.35	0.6-2	0.13-0.17	Moderate	1.0-3.0	.37	.37			
	28-53	18-30	1.25-1.35	0.6-2	0.16-0.20	Moderate	0.0-1.0	.37	.37			
	53-80	15-30	1.30-1.45	0.2-2	0.10-0.18	Low	0.0-0.5	.37	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
LrA:												
Lehr-----	0-7	10-27	1.10-1.40	0.6-6	0.17-0.19	Low	1.0-3.0	.28	.28	3	5	56
	7-19	18-30	1.20-1.50	0.6-6	0.16-0.18	Moderate	1.0-2.0	.20	.28			
	19-80	0-10	1.40-1.70	6-60	0.02-0.04	Low	0.0-1.0	.10	.17			
Bowdle-----	0-10	18-27	1.25-1.35	0.6-2	0.18-0.20	Low	3.0-5.0	.24	.24	4	6	48
	10-24	18-30	1.25-1.35	0.6-2	0.18-0.20	Low	1.0-3.0	.28	.28			
	24-29	18-25	1.45-1.60	0.6-2	0.15-0.18	Low	0.0-1.0	.28	.32			
	29-80	2-7	1.50-1.70	6-60	0.03-0.06	Low	0.0-0.5	.10	.17			
LrB:												
Lehr-----	0-7	10-27	1.10-1.40	0.6-6	0.17-0.19	Low	1.0-3.0	.28	.28	3	5	56
	7-19	18-30	1.20-1.50	0.6-6	0.16-0.18	Moderate	1.0-2.0	.20	.28			
	19-80	0-10	1.40-1.70	6-60	0.02-0.04	Low	0.0-1.0	.10	.17			
Bowdle-----	0-10	18-27	1.25-1.35	0.6-2	0.18-0.20	Low	3.0-5.0	.24	.24	4	6	48
	10-24	18-30	1.25-1.35	0.6-2	0.18-0.20	Low	1.0-3.0	.28	.28			
	24-29	18-25	1.45-1.60	0.6-2	0.15-0.18	Low	0.0-1.0	.28	.32			
	29-80	2-7	1.50-1.70	6-60	0.03-0.06	Low	0.0-0.5	.10	.17			
Ls:												
Lowe-----	0-7	24-27	1.20-1.30	0.6-2	0.17-0.20	Low	5.0-8.0	.24	.24	5	4L	86
	7-34	24-35	1.25-1.35	0.6-2	0.15-0.19	Moderate	1.0-4.0	.28	.28			
	34-80	10-30	1.35-1.50	0.6-2	0.13-0.19	Moderate	0.0-1.0	.28	.28			
Lt:												
Ludden-----	0-14	40-60	1.10-1.30	0.06-0.2	0.16-0.18	High	4.0-9.0	.28	.28	5	4	86
	14-41	40-60	1.20-1.50	0.06-0.2	0.13-0.16	High	0.5-3.0	.28	.28			
	41-80	35-60	1.20-1.50	0.06-0.2	0.13-0.16	High	0.0-0.5	.32	.32			
Lu:												
Ludden, ponded-----	0-14	40-60	1.10-1.30	0.06-0.2	0.16-0.18	High	4.0-9.0	.28	.28	5	4	86
	14-41	40-60	1.20-1.50	0.06-0.2	0.13-0.16	High	0.5-3.0	.28	.28			
	41-80	35-60	1.20-1.50	0.06-0.2	0.13-0.16	High	0.0-0.5	.32	.32			
Lw:												
Ludden, wet-----	0-14	40-60	1.10-1.30	0.06-0.2	0.16-0.18	High	4.0-9.0	.28	.28	5	4	86
	14-41	40-60	1.20-1.50	0.06-0.2	0.13-0.16	High	0.5-3.0	.28	.28			
	41-80	35-60	1.20-1.50	0.06-0.2	0.13-0.16	High	0.0-0.5	.32	.32			
M-W:												
Miscellaneous water---	---	---	---	---	---	---	---	---	---	-	---	---

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
MaC:												
Maddock-----	0-9	5-15	1.35-1.45	6-20	0.13-0.18	Low	1.0-3.0	.20	.20	5	3	86
	9-80	3-9	1.35-1.45	6-20	0.05-0.13	Low	0.5-1.0	.17	.17			
Egeland-----	0-8	10-18	1.25-1.35	2-6	0.11-0.17	Low	1.0-3.0	.20	.20	5	3	86
	8-31	10-18	1.30-1.45	2-6	0.09-0.15	Low	0.5-2.0	.20	.20			
	31-64	5-10	1.40-1.65	2-6	0.08-0.10	Low	0.0-0.5	.17	.17			
	64-80	6-14	1.40-1.65	0.6-2	0.10-0.22	Low	0.0-0.5	.17	.17			
MdA:												
Max-----	0-14	18-27	1.10-1.40	0.6-2	0.20-0.22	Low	3.0-4.0	.28	.28	5	6	48
	14-80	18-35	1.20-1.60	0.2-0.6	0.14-0.19	Moderate	0.0-1.0	.37	.37			
Arnegard-----	0-8	15-25	1.00-1.40	0.6-2	0.18-0.22	Low	3.0-6.0	.24	.24	5	6	48
	8-25	18-30	1.20-1.60	0.6-2	0.17-0.21	Moderate	1.0-3.0	.28	.28			
	25-80	5-30	1.20-1.60	0.6-2	0.13-0.19	Low	0.0-1.0	.28	.28			
MdB:												
Max-----	0-14	18-27	1.10-1.40	0.6-2	0.20-0.22	Low	3.0-4.0	.28	.28	5	6	48
	14-80	18-35	1.20-1.60	0.2-0.6	0.14-0.19	Moderate	0.0-1.0	.37	.37			
Arnegard-----	0-8	15-25	1.00-1.40	0.6-2	0.18-0.22	Low	3.0-6.0	.24	.24	5	6	48
	8-25	18-30	1.20-1.60	0.6-2	0.17-0.21	Moderate	1.0-3.0	.28	.28			
	25-80	5-30	1.20-1.60	0.6-2	0.13-0.19	Low	0.0-1.0	.28	.28			
MgB:												
Max-----	0-14	18-27	1.10-1.40	0.6-2	0.20-0.22	Low	3.0-4.0	.28	.28	5	6	48
	14-80	18-35	1.20-1.60	0.2-0.6	0.14-0.19	Moderate	0.0-1.0	.37	.37			
Arnegard-----	0-8	15-25	1.00-1.40	0.6-2	0.18-0.22	Low	3.0-6.0	.24	.24	5	6	48
	8-25	18-30	1.20-1.60	0.6-2	0.17-0.21	Moderate	1.0-3.0	.28	.28			
	25-80	5-30	1.20-1.60	0.6-2	0.13-0.19	Low	0.0-1.0	.28	.28			
Zahl-----	0-8	18-27	1.10-1.40	0.6-2	0.17-0.22	Moderate	1.0-3.0	.28	.28	5	4L	86
	8-29	20-30	1.20-1.60	0.6-2	0.15-0.19	Moderate	0.0-2.0	.32	.32			
	29-80	20-30	1.20-1.70	0.2-0.6	0.15-0.19	Moderate	0.0-0.5	.37	.37			
MnB:												
Max-----	0-14	18-27	1.10-1.40	0.6-2	0.20-0.22	Low	3.0-4.0	.28	.28	5	6	48
	14-80	18-35	1.20-1.60	0.2-0.6	0.14-0.19	Moderate	0.0-1.0	.37	.37			
Niobell-----	0-12	10-27	1.10-1.30	0.6-2	0.18-0.20	Low	2.0-4.0	.32	.32	5	6	48
	12-28	25-45	1.20-1.50	0.06-0.2	0.15-0.19	High	1.0-3.0	.32	.32			
	28-80	18-30	1.20-1.60	0.2-0.6	0.15-0.19	Moderate	0.0-1.0	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
MnB: (cont.)												
Noonan-----	0-8	15-27	1.10-1.40	0.6-2	0.20-0.22	Low	2.0-6.0	.32	.32	2	6	48
	8-18	35-45	1.20-1.50	0.001-0.06	0.12-0.14	High	0.5-2.0	.32	.32			
	18-80	20-30	1.20-1.60	0.06-0.2	0.10-0.14	Moderate	0.0-0.5	.37	.37			
MxC:												
Max-----	0-14	18-27	1.10-1.40	0.6-2	0.20-0.22	Low	3.0-4.0	.28	.28	5	6	48
	14-80	18-35	1.20-1.60	0.2-0.6	0.14-0.19	Moderate	0.0-1.0	.37	.37			
Zahl-----	0-8	18-27	1.10-1.40	0.6-2	0.17-0.22	Moderate	1.0-3.0	.28	.28	5	4L	86
	8-29	20-30	1.20-1.60	0.6-2	0.15-0.19	Moderate	0.0-2.0	.32	.32			
	29-80	20-30	1.20-1.70	0.2-0.6	0.15-0.19	Moderate	0.0-0.5	.37	.37			
Arnegard-----	0-8	15-25	1.00-1.40	0.6-2	0.18-0.22	Low	3.0-6.0	.24	.24	5	6	48
	8-25	18-30	1.20-1.60	0.6-2	0.17-0.21	Moderate	1.0-3.0	.28	.28			
	25-80	5-30	1.20-1.60	0.6-2	0.13-0.19	Low	0.0-1.0	.28	.28			
My:												
Miranda-----	0-3	18-26	1.15-1.30	0.6-2	0.17-0.19	Low	1.0-3.0	.32	.32	2	6	48
	3-13	35-45	1.40-1.60	0.01-0.06	0.14-0.18	High	0.5-1.0	.32	.32			
	13-80	20-30	1.40-1.60	0.06-0.2	0.13-0.17	Moderate	0.0-0.5	.32	.32			
Heil-----	0-2	18-27	1.20-1.40	0.6-2	0.15-0.24	Moderate	3.0-6.0	.37	.37	2	6	48
	2-24	45-60	1.20-1.55	0.01-0.06	0.13-0.18	High	0.0-1.0	.37	.37			
	24-80	27-50	1.20-1.70	0.06-0.2	0.13-0.18	High	0.0-0.5	.32	.32			
Mz:												
Moritz-----	0-12	20-27	1.20-1.30	0.6-2	0.17-0.20	Low	3.0-6.0	.24	.24	5	4L	86
	12-44	20-35	1.25-1.35	0.6-2	0.15-0.19	Moderate	1.0-4.0	.28	.28			
	44-80	10-27	1.30-1.50	0.6-2	0.13-0.19	Low	1.0-2.0	.28	.28			
Lowe-----	0-7	24-27	1.20-1.30	0.6-2	0.17-0.20	Low	5.0-8.0	.24	.24	5	4L	86
	7-34	24-35	1.25-1.35	0.6-2	0.15-0.19	Moderate	1.0-4.0	.28	.28			
	34-80	10-30	1.35-1.50	0.6-2	0.13-0.19	Moderate	0.0-1.0	.28	.28			
Na:												
Nahon-----	0-7	23-26	1.20-1.30	0.2-0.6	0.19-0.22	Low	2.0-5.0	.37	.37	2	6	48
	7-9	20-30	1.20-1.35	0.2-0.6	0.19-0.22	Moderate	1.0-2.0	.37	.37			
	9-21	35-55	1.25-1.45	0.01-0.06	0.10-0.15	High	1.0-3.0	.37	.37			
	21-43	23-55	1.20-1.35	0.06-0.2	0.11-0.19	High	0.0-1.0	.37	.37			
	43-49	30-60	1.20-1.40	0.06-0.6	0.14-0.17	Moderate	0.0-0.5	.43	.43			
	49-80	25-30	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
Na: (cont.)												
Aberdeen-----	0-13	20-33	1.15-1.25	0.2-0.6	0.19-0.22	Moderate	3.0-4.0	.37	.37	5	6	48
	13-23	35-55	1.20-1.35	0.06-0.2	0.13-0.18	High	1.0-4.0	.37	.37			
	23-39	30-55	1.20-1.35	0.06-0.2	0.14-0.17	High	0.0-2.0	.37	.37			
	39-80	10-26	1.25-1.40	0.06-2	0.14-0.17	Low	0.0-1.0	.43	.43			
Exline-----	0-2	20-26	1.25-1.30	0.6-2	0.19-0.22	Low	1.0-3.0	.37	.37	2	6	48
	2-21	35-55	1.25-1.40	0.01-0.06	0.10-0.15	High	0.0-2.0	.28	.28			
	21-40	35-50	1.25-1.40	0.06-0.2	0.14-0.17	High	0.0-1.0	.43	.43			
	40-80	25-35	1.25-1.40	0.06-0.2	0.14-0.17	Moderate	0.0-0.5	.43	.43			
Nb:												
Nahon-----	0-7	23-26	1.20-1.30	0.2-0.6	0.19-0.22	Low	2.0-5.0	.37	.37	2	6	48
	7-9	20-30	1.20-1.35	0.2-0.6	0.19-0.22	Moderate	1.0-2.0	.37	.37			
	9-21	35-55	1.25-1.45	0.01-0.06	0.10-0.15	High	1.0-3.0	.37	.37			
	21-43	23-55	1.20-1.35	0.06-0.2	0.11-0.19	High	0.0-1.0	.37	.37			
	43-49	30-60	1.20-1.40	0.06-0.6	0.14-0.17	Moderate	0.0-0.5	.43	.43			
	49-80	25-30	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
Aberdeen-----	0-11	20-26	1.10-1.25	0.6-2	0.19-0.22	Moderate	3.0-4.0	.37	.37	5	6	48
	11-23	35-55	1.20-1.35	0.06-0.2	0.13-0.18	High	1.0-4.0	.37	.37			
	23-36	30-55	1.20-1.35	0.06-0.2	0.14-0.17	High	1.0-4.0	.37	.37			
	36-49	10-30	1.25-1.40	0.06-2	0.14-0.17	Moderate	0.0-1.0	.43	.43			
	49-80	25-30	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
Exline-----	0-2	20-26	1.25-1.30	0.6-2	0.19-0.22	Low	1.0-3.0	.37	.37	2	6	48
	2-24	35-55	1.25-1.40	0.01-0.06	0.10-0.15	High	0.0-2.0	.28	.28			
	24-39	35-50	1.25-1.40	0.06-0.2	0.14-0.17	High	0.0-1.0	.43	.43			
	39-55	25-35	1.25-1.40	0.06-0.2	0.14-0.17	Moderate	0.0-0.5	.43	.43			
	55-80	25-30	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			
Nc:												
Niobell-----	0-12	10-27	1.10-1.30	0.6-2	0.18-0.20	Low	2.0-4.0	.32	.32	5	6	48
	12-28	25-45	1.20-1.50	0.06-0.2	0.15-0.19	High	1.0-3.0	.32	.32			
	28-80	18-30	1.20-1.60	0.2-0.6	0.15-0.19	Moderate	0.0-1.0	.37	.37			
Noonan-----	0-8	15-27	1.10-1.40	0.6-2	0.20-0.22	Low	2.0-6.0	.32	.32	2	6	48
	8-18	35-45	1.20-1.50	0.001-0.06	0.12-0.14	High	0.5-2.0	.32	.32			
	18-80	20-30	1.20-1.60	0.06-0.2	0.10-0.14	Moderate	0.0-0.5	.37	.37			
Nd:												
Niobell-----	0-12	10-27	1.10-1.30	0.6-2	0.18-0.20	Low	2.0-4.0	.32	.32	5	6	48
	12-28	25-45	1.20-1.50	0.06-0.2	0.15-0.19	High	1.0-3.0	.32	.32			
	28-80	18-30	1.20-1.60	0.2-0.6	0.15-0.19	Moderate	0.0-1.0	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
Nd: (cont.)												
Noonan-----	0-8	15-27	1.10-1.40	0.6-2	0.20-0.22	Low	2.0-6.0	.32	.32	2	6	48
	8-18	35-45	1.20-1.50	0.001-0.06	0.12-0.14	High	0.5-2.0	.32	.32			
	18-80	20-30	1.20-1.60	0.06-0.2	0.10-0.14	Moderate	0.0-0.5	.37	.37			
Heil-----	0-2	18-27	1.20-1.40	0.6-2	0.15-0.24	Moderate	3.0-6.0	.37	.37	2	6	48
	2-24	45-60	1.20-1.55	0.01-0.06	0.13-0.18	High	0.0-1.0	.37	.37			
	24-80	27-50	1.20-1.70	0.06-0.2	0.13-0.18	High	0.0-0.5	.32	.32			
NeA:												
Niobell-----	0-12	10-27	1.10-1.30	0.6-2	0.18-0.20	Low	2.0-4.0	.32	.32	5	6	48
	12-28	25-45	1.20-1.50	0.06-0.2	0.15-0.19	High	1.0-3.0	.32	.32			
	28-80	18-30	1.20-1.60	0.2-0.6	0.15-0.19	Moderate	0.0-1.0	.37	.37			
Noonan-----	0-8	15-27	1.10-1.40	0.6-2	0.20-0.22	Low	2.0-6.0	.32	.32	2	6	48
	8-18	35-45	1.20-1.50	0.001-0.06	0.12-0.14	High	0.5-2.0	.32	.32			
	18-80	20-30	1.20-1.60	0.06-0.2	0.10-0.14	Moderate	0.0-0.5	.37	.37			
Max-----	0-14	18-27	1.10-1.40	0.6-2	0.20-0.22	Low	3.0-4.0	.28	.28	5	6	48
	14-80	18-35	1.20-1.60	0.2-0.6	0.14-0.19	Moderate	0.0-1.0	.37	.37			
Nm:												
Noonan-----	0-8	15-27	1.10-1.40	0.6-2	0.20-0.22	Low	2.0-6.0	.32	.32	2	6	48
	8-18	35-45	1.20-1.50	0.001-0.06	0.12-0.14	High	0.5-2.0	.32	.32			
	18-80	20-30	1.20-1.60	0.06-0.2	0.10-0.14	Moderate	0.0-0.5	.37	.37			
Miranda-----	0-3	18-26	1.15-1.30	0.6-2	0.17-0.19	Low	1.0-3.0	.32	.32	2	6	48
	3-13	35-45	1.40-1.60	0.01-0.06	0.14-0.18	High	0.5-1.0	.32	.32			
	13-80	20-30	1.40-1.60	0.06-0.2	0.13-0.17	Moderate	0.0-0.5	.32	.32			
Nr:												
Northville-----	0-5	20-27	1.10-1.25	0.6-2	0.19-0.22	Low	2.0-4.0	.37	.37	5	6	48
	5-8	25-35	1.20-1.35	0.2-2	0.17-0.22	Moderate	1.0-2.0	.37	.37			
	8-22	35-50	1.20-1.35	0.06-0.2	0.13-0.18	High	0.5-3.0	.37	.37			
	22-58	20-50	1.20-1.35	0.06-2	0.14-0.17	Moderate	0.5-2.0	.37	.37			
	58-80	28-50	1.25-1.40	0.06-2	0.14-0.17	Moderate	0.0-0.5	.43	.43			
Farmsworth-----	0-8	20-27	1.15-1.25	0.6-2	0.18-0.22	Low	2.0-4.0	.32	.32	2	6	48
	8-25	35-60	1.25-1.40	0.001-0.06	0.10-0.14	High	0.5-2.0	.37	.37			
	25-43	35-55	1.25-1.40	0.06-0.2	0.08-0.12	High	0.0-2.0	.37	.37			
	43-80	25-35	1.30-1.50	0.06-0.6	0.16-0.18	Moderate	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
Nv:												
Northville-----	0-5	20-27	1.10-1.25	0.6-2	0.19-0.22	Low	2.0-4.0	.37	.37	5	6	48
	5-8	25-35	1.20-1.35	0.2-2	0.17-0.22	Moderate	1.0-2.0	.37	.37			
	8-22	35-50	1.20-1.35	0.06-0.2	0.13-0.18	High	0.5-3.0	.37	.37			
	22-58	20-50	1.20-1.35	0.06-2	0.14-0.17	Moderate	0.5-2.0	.37	.37			
	58-80	28-50	1.25-1.40	0.06-2	0.14-0.17	Moderate	0.0-0.5	.43	.43			
Farmsworth-----	0-8	20-27	1.15-1.25	0.6-2	0.18-0.22	Low	2.0-4.0	.32	.32	2	6	48
	8-25	35-60	1.25-1.40	0.001-0.06	0.10-0.14	High	0.5-2.0	.37	.37			
	25-43	35-55	1.25-1.40	0.06-0.2	0.08-0.12	High	0.0-2.0	.37	.37			
	43-80	25-35	1.30-1.50	0.06-0.6	0.16-0.18	Moderate	0.0-0.5	.37	.37			
Hoven-----	0-3	22-26	1.15-1.25	0.6-2	0.19-0.22	Low	2.0-4.0	.37	.37	2	6	48
	3-6	35-60	1.15-1.30	0.01-0.06	0.10-0.19	High	1.0-2.0	.37	.37			
	6-22	35-60	1.15-1.30	0.01-0.06	0.10-0.19	High	1.0-2.0	.37	.37			
	22-80	35-60	1.30-1.50	0.06-0.2	0.08-0.17	High	0.0-1.0	.37	.37			
Ov:												
Overshue-----	0-7	10-18	1.20-1.50	0.6-2	0.13-0.18	Low	4.0-8.0	.20	.20	5	3	86
	7-42	5-18	1.40-1.60	0.6-6	0.10-0.15	Low	0.0-2.0	.24	.24			
	42-80	20-30	1.45-1.65	0.2-0.6	0.16-0.20	Moderate	0.0-0.5	.37	.37			
Pa:												
Parnell-----	0-11	27-40	1.20-1.30	0.2-0.6	0.18-0.22	Moderate	6.0-8.0	.37	.37	5	7	38
	11-41	35-60	1.20-1.30	0.06-0.2	0.13-0.19	High	1.0-5.0	.37	.37			
	41-80	35-45	1.20-1.40	0.06-0.2	0.11-0.19	High	0.0-0.5	.43	.43			
Pc:												
Parshall-----	0-11	10-20	1.10-1.40	0.6-2	0.20-0.22	Low	1.0-4.0	.28	.28	5	5	56
	11-36	5-20	1.20-1.50	2-6	0.13-0.17	Low	1.0-3.0	.20	.20			
	36-80	5-20	1.20-1.60	2-6	0.12-0.17	Low	0.0-1.0	.24	.24			
PeA:												
Peever-----	0-7	27-35	1.25-1.35	0.2-0.6	0.19-0.22	Moderate	3.0-6.0	.32	.32	5	6	48
	7-15	35-50	1.25-1.40	0.06-0.6	0.11-0.19	High	1.0-4.0	.37	.37			
	15-38	30-45	1.50-1.70	0.06-0.6	0.08-0.17	High	0.0-1.0	.37	.37			
	38-80	30-45	1.50-1.70	0.06-0.6	0.08-0.17	High	0.0-0.5	.37	.37			
PgB:												
Peever-----	0-7	27-35	1.25-1.35	0.2-0.6	0.19-0.22	Moderate	3.0-6.0	.32	.32	5	6	48
	7-15	35-50	1.25-1.40	0.06-0.6	0.11-0.19	High	1.0-4.0	.37	.37			
	15-38	30-45	1.50-1.70	0.06-0.6	0.08-0.17	High	0.0-1.0	.37	.37			
	38-80	30-45	1.50-1.70	0.06-0.6	0.08-0.17	High	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
PgB: (cont.)												
Buse-----	0-7	27-35	1.40-1.50	0.2-0.6	0.17-0.22	Moderate	1.0-3.0	.28	.28	5	4L	86
	7-35	18-35	1.55-1.65	0.2-0.6	0.14-0.19	Moderate	0.5-1.0	.37	.37			
	35-80	18-35	1.55-1.65	0.2-0.6	0.14-0.19	Moderate	0.0-0.5	.37	.37			
PoA:												
Peever-----	0-7	27-35	1.25-1.35	0.2-0.6	0.19-0.22	Moderate	3.0-6.0	.32	.32	5	6	48
	7-15	35-50	1.25-1.40	0.06-0.6	0.11-0.19	High	1.0-4.0	.37	.37			
	15-38	30-45	1.50-1.70	0.06-0.6	0.08-0.17	High	0.0-1.0	.37	.37			
	38-80	30-45	1.50-1.70	0.06-0.6	0.08-0.17	High	0.0-0.5	.37	.37			
Cavour-----	0-9	18-25	1.10-1.25	0.6-2	0.18-0.20	Low	2.0-4.0	.32	.32	2	6	48
	9-22	35-50	1.25-1.40	0.001-0.06	0.10-0.16	High	1.0-4.0	.28	.28			
	22-45	25-50	1.25-1.50	0.06-0.2	0.10-0.16	High	0.0-1.0	.37	.37			
	45-80	25-35	1.50-1.75	0.06-0.6	0.11-0.15	Moderate	0.0-0.5	.37	.37			
Pp:												
Pits, gravel and sand-	0-10	10-20	1.25-1.40	2-6	0.11-0.20	Low	0.5-3.0	.20	.28	3	5	56
	10-80	0-5	1.60-1.80	6-60	0.03-0.06	Low	0.0-0.5	.10	.17			
Pr:												
Playmoor-----	0-9	27-34	1.15-1.30	0.2-2	0.16-0.19	Moderate	4.0-8.0	.28	.28	5	4L	86
	9-27	20-34	1.20-1.35	0.2-2	0.16-0.19	Moderate	2.0-4.0	.28	.28			
	27-46	20-34	1.20-1.35	0.2-2	0.14-0.17	Moderate	0.0-2.0	.32	.32			
	46-80	20-34	1.20-1.40	0.2-2	0.14-0.17	Moderate	0.0-0.5	.28	.28			
Py:												
Playmoor, channeled---	0-9	27-34	1.15-1.30	0.2-2	0.16-0.19	Moderate	4.0-8.0	.28	.28	5	4L	86
	9-27	20-34	1.20-1.35	0.2-2	0.16-0.19	Moderate	2.0-4.0	.28	.28			
	27-46	20-34	1.20-1.35	0.2-2	0.14-0.17	Moderate	0.0-2.0	.32	.32			
	46-80	20-34	1.20-1.40	0.2-2	0.14-0.17	Moderate	0.0-0.5	.28	.28			
Lamoure, channeled----	0-19	27-34	1.15-1.25	0.2-2	0.19-0.22	Moderate	4.0-8.0	.28	.28	5	4L	86
	19-38	25-34	1.20-1.35	0.2-2	0.17-0.20	Moderate	1.0-3.0	.32	.32			
	38-55	25-34	1.20-1.35	0.2-2	0.17-0.20	Moderate	0.5-1.0	.43	.43			
	55-80	20-34	1.25-1.40	0.2-2	0.09-0.18	Low	0.0-0.5	.28	.28			
Ra:												
Ranslo-----	0-9	27-35	1.15-1.25	0.06-0.2	0.13-0.16	Moderate	4.0-7.0	.37	.37	2	7	38
	9-25	35-45	1.30-1.40	0.06-0.2	0.13-0.16	High	1.0-3.0	.28	.28			
	25-37	35-50	1.25-1.35	0.06-0.2	0.08-0.13	High	0.0-1.0	.37	.37			
	37-80	27-40	1.20-1.35	0.2-0.6	0.14-0.17	High	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
Re:												
Ranslo-----	0-9	15-26	1.10-1.20	0.6-2	0.17-0.20	Low	4.0-7.0	.32	.32	2	6	48
	9-25	35-45	1.30-1.40	0.06-0.2	0.13-0.16	High	1.0-3.0	.28	.28			
	25-37	35-50	1.25-1.35	0.06-0.2	0.08-0.13	High	0.0-1.0	.37	.37			
	37-80	27-40	1.20-1.35	0.2-0.6	0.14-0.17	High	0.0-0.5	.37	.37			
Harriet-----	0-2	12-25	1.10-1.40	0.6-2	0.18-0.22	Low	3.0-6.0	.32	.32	2	6	48
	2-17	35-50	1.20-1.60	0.01-0.06	0.10-0.15	High	1.0-3.0	.37	.37			
	17-42	18-40	1.20-1.60	0.6-2	0.10-0.15	Moderate	0.5-1.0	.37	.37			
	42-80	18-45	1.20-1.60	0.06-0.2	0.10-0.15	Moderate	0.0-0.5	.37	.37			
RfA:												
Renshaw-----	0-7	20-26	1.20-1.30	0.6-2	0.18-0.20	Low	2.0-4.0	.28	.28	3	6	48
	7-15	18-27	1.30-1.45	0.6-6	0.11-0.18	Low	0.0-1.0	.28	.32			
	15-80	0-10	1.45-1.65	6-60	0.03-0.06	Low	0.0-0.5	.10	.24			
Fordville-----	0-8	18-25	1.20-1.30	0.6-2	0.18-0.20	Low	3.0-7.0	.24	.24	4	6	48
	8-21	18-30	1.25-1.40	0.6-2	0.18-0.21	Moderate	1.0-4.0	.28	.28			
	21-33	15-30	1.25-1.45	0.6-6	0.12-0.18	Low	0.0-2.0	.28	.28			
	33-80	0-5	1.60-1.80	6-60	0.03-0.06	Low	0.0-0.5	.10	.17			
RfB:												
Renshaw-----	0-7	20-26	1.20-1.30	0.6-2	0.18-0.20	Low	2.0-4.0	.28	.28	3	6	48
	7-15	18-27	1.30-1.45	0.6-6	0.11-0.18	Low	0.0-1.0	.28	.32			
	15-80	0-10	1.45-1.65	6-60	0.03-0.06	Low	0.0-0.5	.10	.24			
Fordville-----	0-8	18-25	1.20-1.30	0.6-2	0.18-0.20	Low	3.0-7.0	.24	.24	4	6	48
	8-21	18-30	1.25-1.40	0.6-2	0.18-0.21	Moderate	1.0-4.0	.28	.28			
	21-33	15-30	1.25-1.45	0.6-6	0.12-0.18	Low	0.0-2.0	.28	.28			
	33-80	0-5	1.60-1.80	6-60	0.03-0.06	Low	0.0-0.5	.10	.17			
So:												
Southam-----	0-7	27-40	1.10-1.40	0.2-0.6	0.18-0.23	Moderate	5.0-20	.37	.37	5	4L	86
	7-51	35-50	1.20-1.50	0.06-0.2	0.14-0.20	High	1.0-10	.28	.28			
	51-60	18-50	1.20-1.50	0.06-0.6	0.13-0.17	High	0.0-3.0	.28	.28			
St:												
Stickney-----	0-10	20-27	1.15-1.30	0.6-2	0.20-0.22	Low	2.0-4.0	.37	.37	5	6	48
	10-22	35-45	1.20-1.35	0.06-0.2	0.16-0.19	High	0.0-2.0	.37	.37			
	22-80	20-35	1.50-1.70	0.06-0.6	0.14-0.18	Moderate	0.0-1.0	.37	.37			
Dudley-----	0-7	18-25	1.00-1.20	0.6-2	0.18-0.22	Low	2.0-4.0	.37	.37	2	6	48
	7-18	35-50	1.35-1.45	0.001-0.06	0.10-0.14	High	1.0-3.0	.32	.32			
	18-39	30-50	1.40-1.50	0.06-0.2	0.10-0.14	High	0.5-2.0	.32	.32			
	39-80	20-35	1.55-1.65	0.06-0.6	0.11-0.15	Moderate	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
Su:												
Stickney-----	0-10	20-27	1.15-1.30	0.6-2	0.20-0.22	Low	2.0-4.0	.37	.37	5	6	48
	10-22	35-45	1.20-1.35	0.06-0.2	0.16-0.19	High	0.0-2.0	.37	.37			
	22-80	20-35	1.50-1.70	0.06-0.6	0.14-0.18	Moderate	0.0-1.0	.37	.37			
Dudley-----	0-7	18-25	1.00-1.20	0.6-2	0.18-0.22	Low	2.0-4.0	.37	.37	2	6	48
	7-18	35-50	1.35-1.45	0.001-0.06	0.10-0.14	High	1.0-3.0	.32	.32			
	18-39	30-50	1.40-1.50	0.06-0.2	0.10-0.14	High	0.5-2.0	.32	.32			
	39-80	20-35	1.55-1.65	0.06-0.6	0.11-0.15	Moderate	0.0-0.5	.37	.37			
Hoven-----	0-3	22-26	1.15-1.25	0.6-2	0.19-0.22	Low	2.0-4.0	.37	.37	2	6	48
	3-6	35-60	1.15-1.30	0.01-0.06	0.10-0.19	High	1.0-2.0	.37	.37			
	6-22	35-60	1.15-1.30	0.01-0.06	0.10-0.19	High	1.0-2.0	.37	.37			
	22-80	35-60	1.30-1.50	0.06-0.2	0.08-0.17	High	0.0-1.0	.37	.37			
Sw:												
Straw, channeled-----	0-25	10-27	1.10-1.30	0.6-2	0.16-0.18	Low	3.0-5.0	.28	.28	5	5	56
	25-80	10-35	1.30-1.50	0.6-6	0.13-0.19	Moderate	0.5-1.0	.32	.32			
Sx:												
Straw-----	0-25	10-27	1.10-1.30	0.6-2	0.16-0.18	Low	3.0-5.0	.28	.28	5	5	56
	25-80	10-35	1.30-1.50	0.6-6	0.13-0.19	Moderate	0.5-1.0	.32	.32			
TbE:												
Talmo, stony-----	0-7	18-25	1.20-1.45	0.6-2	0.18-0.20	Low	1.0-3.0	.20	.28	2	8	0
	7-80	0-10	1.45-1.65	6-60	0.03-0.06	Low	0.0-0.5	.05	.15			
Ethan, stony-----	0-8	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	1.0-3.0	.28	.28	5	8	0
	8-20	18-30	1.30-1.45	0.6-2	0.16-0.20	Moderate	0.5-1.0	.32	.32			
	20-32	18-30	1.45-1.70	0.6-2	0.16-0.20	Moderate	0.0-0.5	.37	.43			
	32-60	18-30	1.45-1.70	0.2-2	0.16-0.20	Moderate	0.0-0.5	.37	.43			
Te:												
Tetonka-----	0-13	20-27	1.10-1.25	0.6-2	0.19-0.22	Moderate	4.0-8.0	.37	.37	5	6	48
	13-39	35-60	1.20-1.35	0.06-0.2	0.13-0.19	High	1.0-3.0	.28	.28			
	39-80	30-50	1.35-1.50	0.06-0.6	0.11-0.17	High	0.0-1.0	.32	.32			
Tk:												
Toko-----	0-8	5-15	1.25-1.35	2-6	0.11-0.17	Low	3.0-6.0	.24	.24	5	3	86
	8-11	5-10	1.25-1.35	2-6	0.08-0.15	Low	0.0-2.0	.24	.24			
	11-28	18-35	1.25-1.50	0.2-0.6	0.12-0.18	Moderate	0.0-2.0	.32	.32			
	28-56	5-20	1.25-1.45	0.6-6	0.08-0.18	Low	0.0-0.5	.32	.32			
	56-80	15-30	1.50-1.70	0.2-0.6	0.16-0.20	Moderate	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
Tm: Toko, wet-----	0-8	5-15	1.25-1.35	2-6	0.11-0.17	Low	3.0-6.0	.24	.24	5	3	86
	8-11	5-10	1.25-1.35	2-6	0.08-0.15	Low	0.0-2.0	.24	.24			
	11-28	18-35	1.25-1.50	0.2-0.6	0.12-0.18	Moderate	0.0-2.0	.32	.32			
	28-56	5-20	1.25-1.45	0.6-6	0.08-0.18	Low	0.0-0.5	.32	.32			
	56-80	15-30	1.50-1.70	0.2-0.6	0.16-0.20	Moderate	0.0-0.5	.37	.37			
Tn: Tonka-----	0-16	18-27	1.10-1.30	0.6-2	0.20-0.24	Low	5.0-10	.37	.37	5	6	48
	16-41	35-50	1.40-1.65	0.06-0.2	0.14-0.20	High	1.0-3.0	.43	.43			
	41-80	27-39	1.40-1.70	0.2-2	0.14-0.19	Moderate	0.0-1.0	.37	.37			
To: Tonka-----	0-16	18-27	1.10-1.30	0.6-2	0.20-0.24	Low	5.0-10	.37	.37	5	6	48
	16-41	35-50	1.40-1.65	0.06-0.2	0.14-0.20	High	1.0-3.0	.43	.43			
	41-80	27-39	1.40-1.70	0.2-2	0.14-0.19	Moderate	0.0-1.0	.37	.37			
Rimlap-----	0-10	20-27	1.10-1.30	0.6-2	0.19-0.22	Low	3.0-6.0	.28	.28	5	6	48
	10-39	35-55	1.25-1.50	0.06-0.2	0.11-0.16	High	0.5-1.0	.37	.37			
	39-45	35-55	1.25-1.50	0.06-0.2	0.14-0.20	High	0.0-0.5	.32	.32			
	45-80	18-35	1.35-1.60	0.2-0.6	0.14-0.20	Moderate	0.0-0.5	.32	.32			
Us: Udorthents, silty----	0-8	18-26	1.20-1.50	0.6-2	0.17-0.22	Low	1.0-3.0	.32	.32	5	4L	86
	8-80	18-35	1.30-1.60	0.2-0.6	0.14-0.19	Moderate	0.0-0.5	.37	.37			
Va: Vallers-----	0-6	18-27	1.20-1.35	0.6-2	0.22-0.24	Low	5.0-8.0	.28	.28	5	4L	86
	6-30	18-35	1.40-1.55	0.2-0.6	0.15-0.19	Moderate	1.0-3.0	.28	.28			
	30-80	18-35	1.50-1.70	0.2-0.6	0.17-0.19	Low	0.0-0.5	.37	.37			
Hamerly-----	0-9	18-27	1.30-1.60	0.6-2	0.18-0.24	Moderate	3.0-4.0	.24	.24	5	4L	86
	9-29	18-35	1.20-1.60	0.6-2	0.15-0.19	Moderate	1.0-3.0	.28	.28			
	29-80	18-35	1.30-1.60	0.2-0.6	0.14-0.19	Moderate	0.0-0.5	.37	.37			
VgA: Vang-----	0-9	18-27	1.10-1.40	0.6-2	0.17-0.21	Low	3.0-8.0	.24	.24	4	6	48
	9-29	18-30	1.20-1.50	0.6-2	0.15-0.19	Low	0.5-1.0	.32	.32			
	29-80	0-5	1.40-1.90	6-20	0.02-0.04	Low	0.0-1.0	.10	.15			
W: Water-----	---	---	---	---	---	---	---	---	---	-	---	---

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
WaA:												
Williams-----	0-7	10-27	1.20-1.60	0.6-2	0.18-0.20	Low	2.0-7.0	.28	.28	5	6	48
	7-22	24-35	1.20-1.60	0.6-2	0.16-0.20	Moderate	0.0-2.0	.28	.28			
	22-80	18-35	1.30-1.60	0.2-0.6	0.15-0.18	Moderate	0.0-1.0	.37	.37			
Bowbells-----	0-8	20-26	1.10-1.30	0.6-2	0.17-0.20	Low	4.0-6.0	.24	.24	5	6	48
	8-28	25-35	1.20-1.60	0.6-2	0.16-0.22	Moderate	1.0-5.0	.28	.28			
	28-80	25-35	1.20-1.60	0.2-0.6	0.14-0.18	Moderate	0.0-2.0	.37	.37			
WaB:												
Williams-----	0-7	10-27	1.20-1.60	0.6-2	0.18-0.20	Low	2.0-7.0	.28	.28	5	6	48
	7-22	24-35	1.20-1.60	0.6-2	0.16-0.20	Moderate	0.0-2.0	.28	.28			
	22-80	18-35	1.30-1.60	0.2-0.6	0.15-0.18	Moderate	0.0-1.0	.37	.37			
Bowbells-----	0-8	20-26	1.10-1.30	0.6-2	0.17-0.20	Low	4.0-6.0	.24	.24	5	6	48
	8-28	25-35	1.20-1.60	0.6-2	0.16-0.22	Moderate	1.0-5.0	.28	.28			
	28-80	25-35	1.20-1.60	0.2-0.6	0.14-0.18	Moderate	0.0-2.0	.37	.37			
WbA:												
Williams-----	0-7	10-27	1.20-1.60	0.6-2	0.18-0.20	Low	2.0-7.0	.28	.28	5	6	48
	7-22	24-35	1.20-1.60	0.6-2	0.16-0.20	Moderate	0.0-2.0	.28	.28			
	22-80	18-35	1.30-1.60	0.2-0.6	0.15-0.18	Moderate	0.0-1.0	.37	.37			
Bowbells-----	0-8	20-26	1.10-1.30	0.6-2	0.17-0.20	Low	4.0-6.0	.24	.24	5	6	48
	8-28	25-35	1.20-1.60	0.6-2	0.16-0.22	Moderate	1.0-5.0	.28	.28			
	28-80	25-35	1.20-1.60	0.2-0.6	0.14-0.18	Moderate	0.0-2.0	.37	.37			
Tonka-----	0-16	18-27	1.10-1.30	0.6-2	0.20-0.24	Low	5.0-10	.37	.37	5	6	48
	16-41	35-50	1.40-1.65	0.06-0.2	0.14-0.20	High	1.0-3.0	.43	.43			
	41-80	27-39	1.40-1.70	0.2-2	0.14-0.19	Moderate	0.0-1.0	.37	.37			
WbB:												
Williams-----	0-7	10-27	1.20-1.60	0.6-2	0.18-0.20	Low	2.0-7.0	.28	.28	5	6	48
	7-22	24-35	1.20-1.60	0.6-2	0.16-0.20	Moderate	0.0-2.0	.28	.28			
	22-80	18-35	1.30-1.60	0.2-0.6	0.15-0.18	Moderate	0.0-1.0	.37	.37			
Bowbells-----	0-8	20-26	1.10-1.30	0.6-2	0.17-0.20	Low	4.0-6.0	.24	.24	5	6	48
	8-28	25-35	1.20-1.60	0.6-2	0.16-0.22	Moderate	1.0-5.0	.28	.28			
	28-80	25-35	1.20-1.60	0.2-0.6	0.14-0.18	Moderate	0.0-2.0	.37	.37			
Tonka-----	0-16	18-27	1.10-1.30	0.6-2	0.20-0.24	Low	5.0-10	.37	.37	5	6	48
	16-41	35-50	1.40-1.65	0.06-0.2	0.14-0.20	High	1.0-3.0	.43	.43			
	41-80	27-39	1.40-1.70	0.2-2	0.14-0.19	Moderate	0.0-1.0	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
WcA:												
Williams-----	0-7	10-27	1.20-1.60	0.6-2	0.18-0.20	Low	2.0-7.0	.28	.28	5	6	48
	7-22	24-35	1.20-1.60	0.6-2	0.16-0.20	Moderate	0.0-2.0	.28	.28			
	22-80	18-35	1.30-1.60	0.2-0.6	0.15-0.18	Moderate	0.0-1.0	.37	.37			
Niobell-----	0-12	10-27	1.10-1.30	0.6-2	0.18-0.20	Low	2.0-4.0	.32	.32	5	6	48
	12-28	25-45	1.20-1.50	0.06-0.2	0.15-0.19	High	1.0-3.0	.32	.32			
	28-80	18-30	1.20-1.60	0.2-0.6	0.15-0.19	Moderate	0.0-1.0	.37	.37			
WcB:												
Williams-----	0-7	10-27	1.20-1.60	0.6-2	0.18-0.20	Low	2.0-7.0	.28	.28	5	6	48
	7-22	24-35	1.20-1.60	0.6-2	0.16-0.20	Moderate	0.0-2.0	.28	.28			
	22-80	18-35	1.30-1.60	0.2-0.6	0.15-0.18	Moderate	0.0-1.0	.37	.37			
Niobell-----	0-12	10-27	1.10-1.30	0.6-2	0.18-0.20	Low	2.0-4.0	.32	.32	5	6	48
	12-28	25-45	1.20-1.50	0.06-0.2	0.15-0.19	High	1.0-3.0	.32	.32			
	28-80	18-30	1.20-1.60	0.2-0.6	0.15-0.19	Moderate	0.0-1.0	.37	.37			
WdA:												
Williams-----	0-7	10-27	1.20-1.60	0.6-2	0.18-0.20	Low	2.0-7.0	.28	.28	5	6	48
	7-22	24-35	1.20-1.60	0.6-2	0.16-0.20	Moderate	0.0-2.0	.28	.28			
	22-80	18-35	1.30-1.60	0.2-0.6	0.15-0.18	Moderate	0.0-1.0	.37	.37			
Niobell-----	0-12	10-27	1.10-1.30	0.6-2	0.18-0.20	Low	2.0-4.0	.32	.32	5	6	48
	12-28	25-45	1.20-1.50	0.06-0.2	0.15-0.19	High	1.0-3.0	.32	.32			
	28-80	18-30	1.20-1.60	0.2-0.6	0.15-0.19	Moderate	0.0-1.0	.37	.37			
Tonka-----	0-16	18-27	1.10-1.30	0.6-2	0.20-0.24	Low	5.0-10	.37	.37	5	6	48
	16-41	35-50	1.40-1.65	0.06-0.2	0.14-0.20	High	1.0-3.0	.43	.43			
	41-80	27-39	1.40-1.70	0.2-2	0.14-0.19	Moderate	0.0-1.0	.37	.37			
WhD:												
Williams-----	0-7	10-27	1.20-1.60	0.6-2	0.18-0.20	Low	2.0-7.0	.28	.28	5	6	48
	7-22	24-35	1.20-1.60	0.6-2	0.16-0.20	Moderate	0.0-2.0	.28	.28			
	22-80	18-35	1.30-1.60	0.2-0.6	0.15-0.18	Moderate	0.0-1.0	.37	.37			
Vida-----	0-3	15-27	1.20-1.30	0.6-2	0.18-0.20	Low	2.0-4.0	.28	.28	5	6	48
	3-9	25-35	1.30-1.45	0.2-0.6	0.16-0.20	Moderate	1.0-2.0	.28	.28			
	9-21	25-35	1.30-1.45	0.2-0.6	0.16-0.20	Moderate	0.0-1.0	.32	.32			
	21-80	25-35	1.50-1.70	0.2-0.6	0.16-0.20	Moderate	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
WmB:												
Williams-----	0-7	10-27	1.20-1.60	0.6-2	0.18-0.20	Low	2.0-7.0	.28	.28	5	6	48
	7-22	24-35	1.20-1.60	0.6-2	0.16-0.20	Moderate	0.0-2.0	.28	.28			
	22-80	18-35	1.30-1.60	0.2-0.6	0.15-0.18	Moderate	0.0-1.0	.37	.37			
Zahl-----	0-8	18-27	1.10-1.40	0.6-2	0.17-0.22	Moderate	1.0-3.0	.28	.28	5	4L	86
	8-29	20-30	1.20-1.60	0.6-2	0.15-0.19	Moderate	0.0-2.0	.32	.32			
	29-80	20-30	1.20-1.70	0.2-0.6	0.15-0.19	Moderate	0.0-0.5	.37	.37			
Bowbells-----	0-8	20-26	1.10-1.30	0.6-2	0.17-0.20	Low	4.0-6.0	.24	.24	5	6	48
	8-28	25-35	1.20-1.60	0.6-2	0.16-0.22	Moderate	1.0-5.0	.28	.28			
	28-80	25-35	1.20-1.60	0.2-0.6	0.14-0.18	Moderate	0.0-2.0	.37	.37			
WmC:												
Williams-----	0-7	10-27	1.20-1.60	0.6-2	0.18-0.20	Low	2.0-7.0	.28	.28	5	6	48
	7-22	24-35	1.20-1.60	0.6-2	0.16-0.20	Moderate	0.0-2.0	.28	.28			
	22-80	18-35	1.30-1.60	0.2-0.6	0.15-0.18	Moderate	0.0-1.0	.37	.37			
Zahl-----	0-8	18-27	1.10-1.40	0.6-2	0.17-0.22	Moderate	1.0-3.0	.28	.28	5	4L	86
	8-29	20-30	1.20-1.60	0.6-2	0.15-0.19	Moderate	0.0-2.0	.32	.32			
	29-80	20-30	1.20-1.70	0.2-0.6	0.15-0.19	Moderate	0.0-0.5	.37	.37			
Bowbells-----	0-8	20-26	1.10-1.30	0.6-2	0.17-0.20	Low	4.0-6.0	.24	.24	5	6	48
	8-28	25-35	1.20-1.60	0.6-2	0.16-0.22	Moderate	1.0-5.0	.28	.28			
	28-80	25-35	1.20-1.60	0.2-0.6	0.14-0.18	Moderate	0.0-2.0	.37	.37			
Wn:												
Winship-----	0-25	18-26	1.15-1.30	0.6-2	0.19-0.22	Low	4.0-6.0	.37	.37	5	6	48
	25-57	26-34	1.20-1.25	0.2-0.6	0.19-0.22	Moderate	0.0-3.0	.37	.37			
	57-80	24-30	1.20-1.35	0.06-0.6	0.17-0.20	Moderate	0.0-1.0	.43	.43			
Tonka-----	0-16	18-27	1.10-1.30	0.6-2	0.20-0.24	Low	5.0-10	.37	.37	5	6	48
	16-41	35-50	1.40-1.65	0.06-0.2	0.14-0.20	High	1.0-3.0	.43	.43			
	41-80	27-39	1.40-1.70	0.2-2	0.14-0.19	Moderate	0.0-1.0	.37	.37			
Wo:												
Winship-----	0-18	18-26	1.15-1.30	0.6-2	0.19-0.22	Low	4.0-6.0	.37	.37	5	6	48
	18-41	26-34	1.20-1.25	0.2-0.6	0.19-0.22	Moderate	0.0-3.0	.37	.37			
	41-57	24-30	1.20-1.35	0.06-0.6	0.17-0.20	Moderate	0.0-1.0	.43	.43			
	57-80	25-30	1.50-1.70	0.2-0.6	0.17-0.20	Moderate	0.0-0.5	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
Wo: (cont.)												
Tonka-----	0-16	18-27	1.10-1.30	0.6-2	0.20-0.24	Low	5.0-10	.37	.37	5	6	48
	16-41	35-50	1.40-1.65	0.06-0.2	0.14-0.20	High	1.0-3.0	.43	.43			
	41-80	27-39	1.40-1.70	0.2-2	0.14-0.19	Moderate	0.0-1.0	.37	.37			
Ws:												
Woonsocket-----	0-9	5-20	1.25-1.35	2-6	0.11-0.15	Low	2.0-4.0	.20	.20	5	3	86
	9-25	18-35	1.25-1.40	0.2-2	0.15-0.20	Moderate	0.5-2.0	.28	.28			
	25-80	5-10	1.40-1.60	2-20	0.06-0.10	Low	0.0-0.5	.17	.17			
Whitelake-----	0-8	5-15	1.25-1.40	0.6-2	0.11-0.17	Low	1.0-3.0	.24	.24	2	3	86
	8-12	5-15	1.25-1.40	0.6-6	0.09-0.15	Low	0.5-2.0	.24	.24			
	12-21	18-35	1.35-1.55	0.06-0.2	0.10-0.15	Moderate	0.5-2.0	.32	.32			
	21-80	10-25	1.30-1.55	0.6-6	0.06-0.17	Low	0.0-0.5	.32	.32			
Wt:												
Worthing-----	0-10	35-40	1.15-1.25	0.2-0.6	0.19-0.22	High	3.0-5.0	.37	.37	5	4	86
	10-45	40-60	1.25-1.40	0.06-0.2	0.13-0.18	High	0.0-3.0	.28	.28			
	45-60	30-50	1.35-1.50	0.2-0.6	0.11-0.17	High	0.0-2.0	.32	.32			
Ww:												
Worthing, ponded-----	0-10	35-40	1.15-1.25	0.2-0.6	0.19-0.22	High	3.0-5.0	.37	.37	5	8	86
	10-45	40-60	1.25-1.40	0.06-0.2	0.13-0.18	High	0.0-3.0	.28	.28			
	45-60	30-50	1.35-1.50	0.2-0.6	0.11-0.17	High	0.0-2.0	.32	.32			
ZaE:												
Zahill-----	0-3	20-27	1.20-1.30	0.6-2	0.18-0.20	Low	1.0-3.0	.32	.32	5	4L	86
	3-18	25-35	1.20-1.45	0.2-0.6	0.16-0.20	Moderate	0.5-1.0	.32	.32			
	18-80	20-35	1.50-1.70	0.2-0.6	0.16-0.20	Moderate	0.0-0.5	.37	.37			
ZbC:												
Zahl-----	0-8	18-27	1.10-1.40	0.6-2	0.17-0.22	Moderate	1.0-3.0	.28	.28	5	4L	86
	8-29	20-30	1.20-1.60	0.6-2	0.15-0.19	Moderate	0.0-2.0	.32	.32			
	29-80	20-30	1.20-1.70	0.2-0.6	0.15-0.19	Moderate	0.0-0.5	.37	.37			
Max-----	0-14	18-27	1.10-1.40	0.6-2	0.20-0.22	Low	3.0-4.0	.28	.28	5	6	48
	14-80	18-35	1.20-1.60	0.2-0.6	0.14-0.19	Moderate	0.0-1.0	.37	.37			
ZbD:												
Zahl-----	0-8	18-27	1.10-1.40	0.6-2	0.17-0.22	Moderate	1.0-3.0	.28	.28	5	4L	86
	8-29	20-30	1.20-1.60	0.6-2	0.15-0.19	Moderate	0.0-2.0	.32	.32			
	29-80	20-30	1.20-1.70	0.2-0.6	0.15-0.19	Moderate	0.0-0.5	.37	.37			
Max-----	0-14	18-27	1.10-1.40	0.6-2	0.20-0.22	Low	3.0-4.0	.28	.28	5	6	48
	14-80	18-35	1.20-1.60	0.2-0.6	0.14-0.19	Moderate	0.0-1.0	.37	.37			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	<i>In</i>	<i>Pct</i>	<i>g/cc</i>	<i>In/hr</i>	<i>In/in</i>		<i>Pct</i>					
ZgD:												
Zell-----	0-7	10-18	1.15-1.30	0.6-2	0.19-0.22	Low	1.0-3.0	.32	.32	5	4L	86
	7-31	10-18	1.25-1.40	0.6-2	0.15-0.20	Low	0.0-1.0	.43	.43			
	31-80	5-18	1.25-1.40	0.06-2	0.15-0.20	Low	0.0-0.5	.43	.43			
Great Bend-----	0-7	20-26	1.10-1.25	0.6-2	0.19-0.22	Low	2.0-4.0	.32	.32	5	6	48
	7-12	18-30	1.15-1.30	0.6-2	0.17-0.20	Moderate	1.0-3.0	.32	.32			
	12-32	18-30	1.15-1.30	0.6-2	0.17-0.20	Low	0.0-1.0	.43	.43			
	32-53	18-25	1.20-1.35	0.2-0.6	0.17-0.20	Low	0.0-0.5	.43	.43			
	53-80	18-25	1.20-1.35	0.06-2	0.17-0.20	Low	0.0-0.5	.43	.43			

Chemical Properties of the Soils

(Dashes (--) indicate that data were not available or were not estimated.)

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
Aa:								
Aastad -----	0-14	24-27	18-28	6.1-7.8	0	0	0	0
	14-29	28-35	15-31	6.6-7.8	0-1	0	0-2	0
	29-80	24-35	10-25	7.4-8.4	5-30	0-1	0-4	0
Ab:								
Aastad -----	0-14	24-27	18-28	6.1-7.8	0	0	0	0
	14-29	28-35	15-31	6.6-7.8	0-1	0	0-2	0
	29-80	24-35	10-25	7.4-8.4	5-30	0-1	0-4	0
Hamerly -----	0-9	18-27	15-30	6.6-8.4	0-10	0	0-2	0
	9-29	18-35	10-20	7.4-8.4	15-35	0-2	0-4	0-2
	29-80	18-35	10-20	7.4-8.4	10-30	0-2	0-4	0-2
Ad:								
Aastad -----	0-14	24-27	18-28	6.1-7.8	0	0	0	0
	14-29	28-35	15-31	6.6-7.8	0-1	0	0-2	0
	29-80	24-35	10-25	7.4-8.4	5-30	0-1	0-4	0
Tonka -----	0-16	18-27	15-35	5.6-7.8	0	0	0	0
	16-41	35-50	15-35	5.6-7.8	0-1	0-1	0-2	0-1
	41-80	27-39	10-25	6.6-8.4	5-20	0-2	0-4	0-2
Ae:								
Aberdeen -----	0-11	20-26	25-28	5.6-7.3	0	0	0-2	0
	11-23	35-55	30-35	6.6-8.4	0-10	0	0-4	0-10
	23-36	30-55	25-35	7.4-9.0	10-20	0-5	2-8	5-15
	36-49	10-30	15-35	7.4-9.0	5-15	0-5	2-8	5-15
	49-80	25-30	10-20	7.4-9.0	5-15	0-5	2-8	5-15
Nahon -----	0-7	23-26	20-30	5.6-7.3	0	0	0-2	0-3
	7-9	20-30	20-30	5.6-7.3	0	0	0-2	0-3
	9-21	35-55	30-40	6.6-9.0	0	0	0-2	0-10
	21-43	23-55	25-35	7.4-9.0	10-20	0-5	4-16	5-15
	43-49	30-60	20-35	7.9-9.0	10-20	0-5	4-16	5-20
	49-80	25-30	10-20	7.4-9.0	5-15	0-5	2-8	5-15
Ah:								
Aberdeen -----	0-13	27-33	25-30	5.6-7.3	0	0	0-2	0
	13-23	35-55	30-35	6.6-8.4	0-10	0	0-4	0-10
	23-39	30-55	25-35	7.4-9.0	10-20	0-10	2-8	5-15
	39-80	10-26	15-35	7.4-9.0	5-15	0-5	2-8	5-15
Nahon -----	0-7	23-26	20-30	5.6-7.3	0	0	0-2	0-3
	7-9	20-30	20-30	5.6-7.3	0	0	0-2	0-3
	9-21	35-55	30-40	6.6-9.0	0	0	0-2	0-10
	21-43	23-55	25-35	7.4-9.0	10-20	0-5	4-16	5-15
	43-49	30-60	20-35	7.9-9.0	10-20	0-5	4-16	5-20
	49-80	25-30	10-20	7.4-9.0	5-15	0-5	2-8	5-15
An:								
Aberdeen -----	0-13	20-33	25-30	5.6-7.3	0	0	0-2	0
	13-23	35-55	30-35	6.6-8.4	0-10	0	0-4	0-10
	23-39	30-55	25-35	7.4-9.0	10-20	0-10	2-8	5-15
	39-80	10-26	15-35	7.4-9.0	5-15	0-5	2-8	5-15

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	<i>In</i>	<i>Pct</i>	<i>meq/100 g</i>	<i>pH</i>	<i>Pct</i>	<i>Pct</i>	<i>mmhos/cm</i>	
An: (cont.)								
Nahon-----	0-7	23-26	20-30	5.6-7.3	0	0	0-2	0-3
	7-9	20-30	20-30	5.6-7.3	0	0	0-2	0-3
	9-21	35-55	30-40	6.6-9.0	0	0	0-2	0-10
	21-43	23-55	25-35	7.4-9.0	10-20	0-5	4-16	5-15
	43-49	30-60	20-35	7.9-9.0	10-20	0-5	4-16	5-20
	49-80	25-30	10-20	7.4-9.0	5-15	0-5	2-8	5-15
Heil-----	0-2	18-27	15-30	5.6-7.3	0	0	0-2	0
	2-24	45-60	20-35	6.1-9.0	0-5	0-1	4-16	5-20
	24-80	27-50	10-20	7.4-9.0	3-20	0-5	4-16	10-20
Ao:								
Aberdeen-----	0-11	20-26	25-28	5.6-7.3	0	0	0-2	0
	11-23	35-55	30-35	6.6-8.4	0-10	0	0-4	0-10
	23-36	30-55	25-35	7.4-9.0	10-20	0-5	2-8	5-15
	36-49	10-30	15-35	7.4-9.0	5-15	0-5	2-8	5-15
	49-80	25-30	10-20	7.4-9.0	5-15	0-5	2-8	5-15
Nahon-----	0-7	23-26	20-30	5.6-7.3	0	0	0-2	0-3
	7-9	20-30	20-30	5.6-7.3	0	0	0-2	0-3
	9-21	35-55	30-40	6.6-9.0	0	0	0-2	0-10
	21-43	23-55	25-35	7.4-9.0	10-20	0-5	4-16	5-15
	43-49	30-60	20-35	7.9-9.0	10-20	0-5	4-16	5-20
	49-80	25-30	10-20	7.4-9.0	5-15	0-5	2-8	5-15
Heil-----	0-2	18-27	15-30	5.6-7.3	0	0	0-2	0
	2-24	45-60	20-35	6.1-9.0	0-5	0-1	4-16	5-20
	24-47	27-50	10-20	7.4-9.0	3-20	0-5	4-16	10-20
	47-80	27-50	10-20	7.4-9.0	3-20	0-5	4-16	10-20
At:								
Aquents, loamy-----	0-10	18-27	15-30	6.6-8.4	5-20	0-2	0-2	0-2
	10-80	18-27	10-25	7.4-9.0	5-20	0-2	0-4	0-5
BaC:								
Beadle-----	0-7	20-26	15-20	6.1-7.3	0	0	0-2	0
	7-26	35-45	15-30	6.6-7.8	0-10	0	0-2	0-1
	26-80	27-45	15-25	7.4-8.4	1-20	0-5	2-4	0-1
BdA:								
Beadle-----	0-7	20-26	15-20	6.1-7.3	0	0	0-2	0
	7-26	35-45	15-30	6.6-7.8	0-10	0	0-2	0-1
	26-80	27-45	15-25	7.4-8.4	1-20	0-5	2-4	0-1
Dudley-----	0-7	18-25	12-21	5.6-7.3	0	0	0-2	0-5
	7-18	35-50	17-26	6.1-8.4	0-5	0	4-8	10-20
	18-39	30-50	16-24	7.4-9.0	1-20	1-5	8-16	3-10
	39-80	20-35	11-17	7.4-9.0	1-15	1-5	8-16	3-15
BeA:								
Beadle-----	0-7	20-26	15-20	6.1-7.3	0	0	0-2	0
	7-26	35-45	15-30	6.6-7.8	0-10	0	0-2	0-1
	26-80	27-45	15-25	7.4-8.4	1-20	0-5	2-4	0-1
Stickney-----	0-10	20-27	20-25	5.6-7.8	0	0	0-2	0
	10-22	35-45	25-30	6.1-7.8	0	0	4-8	5-15
	22-80	20-35	15-25	7.4-9.0	5-20	1-5	4-16	5-15

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
BeB:								
Beadle -----	0-7	20-26	15-20	6.1-7.3	0	0	0-2	0
	7-26	35-45	15-30	6.6-7.8	0-10	0	0-2	0-1
	26-80	27-45	15-25	7.4-8.4	1-20	0-5	2-4	0-1
Stickney -----	0-10	20-27	20-25	5.6-7.8	0	0	0-2	0
	10-22	35-45	25-30	6.1-7.8	0	0	4-8	5-15
	22-80	20-35	15-25	7.4-9.0	5-20	1-5	4-16	5-15
BfA:								
Beadle, stony -----	0-7	20-26	15-20	6.1-7.3	0	0	0-2	0
	7-26	35-45	15-30	6.6-7.8	0-10	0	0-2	0-1
	26-80	27-45	15-25	7.4-8.4	1-20	0-5	2-4	0-1
Stickney, stony -----	0-10	20-27	20-25	5.6-7.8	0	0	0-2	0
	10-22	35-45	25-30	6.1-7.8	0	0	4-8	5-15
	22-80	20-35	15-25	7.4-9.0	5-20	1-5	4-16	5-15
BfB:								
Beadle, stony -----	0-7	20-26	15-20	6.1-7.3	0	0	0-2	0
	7-26	35-45	15-30	6.6-7.8	0-10	0	0-2	0-1
	26-80	27-45	15-25	7.4-8.4	1-20	0-5	2-4	0-1
Stickney, stony -----	0-10	20-27	20-25	5.6-7.8	0	0	0-2	0
	10-22	35-45	25-30	6.1-7.8	0	0	4-8	5-15
	22-80	20-35	15-25	7.4-9.0	5-20	1-5	4-16	5-15
Bg:								
Bearden -----	0-7	18-26	15-30	7.4-8.4	0-10	0-1	0-4	0-2
	7-16	18-34	5-25	7.4-8.4	10-45	0-1	0-4	0-3
	16-38	18-34	5-20	7.4-8.4	5-20	0-5	0-4	0-10
	38-80	15-59	5-35	7.4-8.4	5-20	0-5	0-8	0-10
Bk:								
Bearden -----	0-7	18-26	15-30	7.4-8.4	0-10	0-1	0-4	0-2
	7-16	18-34	5-25	7.4-8.4	10-45	0-1	0-4	0-3
	16-38	18-34	5-20	7.4-8.4	5-20	0-5	0-4	0-10
	38-80	15-59	5-35	7.4-8.4	5-20	0-5	0-8	0-10
Tonka -----	0-16	18-27	15-35	5.6-7.8	0	0	0	0
	16-41	35-50	15-35	5.6-7.8	0-1	0-1	0-2	0-1
	41-80	27-39	10-25	6.6-8.4	5-20	0-2	0-4	0-2
Bo:								
Beotia -----	0-9	20-27	17-30	6.1-7.8	0	0	0-2	0
	9-21	18-30	10-14	6.1-7.8	0-3	0	0-2	0
	21-39	18-30	10-14	7.4-8.4	5-35	0-2	0-4	0-2
	39-80	18-35	10-14	7.4-8.4	1-25	0-2	0-8	0-4
Br:								
Beotia -----	0-9	20-27	17-30	6.1-7.8	0	0	0-2	0
	9-21	18-30	10-14	6.1-7.8	0-3	0	0-2	0
	21-39	18-30	10-14	7.4-8.4	5-35	0-2	0-4	0-2
	39-80	18-35	10-14	7.4-8.4	1-25	0-2	0-8	0-4
Rondell -----	0-11	18-26	15-25	6.6-8.4	1-5	0	0-4	0-2
	11-36	19-34	10-16	7.4-9.0	15-45	0-2	2-8	0-6
	36-80	19-30	10-15	7.4-8.4	10-30	0-2	2-8	0-6

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
Bs:								
Beotia-----	0-9	20-27	17-30	6.1-7.8	0	0	0-2	0
	9-21	18-30	10-14	6.1-7.8	0-3	0	0-2	0
	21-39	18-30	10-14	7.4-8.4	5-35	0-2	0-4	0-2
	39-80	18-35	10-14	7.4-8.4	1-25	0-2	0-8	0-4
Winship-----	0-25	18-26	25-30	6.6-7.8	0	0	0-2	0
	25-57	26-34	25-30	6.6-7.8	0-1	0	0-2	0
	57-80	24-30	15-20	6.6-8.4	0-15	0-1	0-2	0-2
Bt:								
Beotia-----	0-12	20-27	17-30	6.1-7.8	0	0	0-2	0
	12-27	18-30	14-22	6.1-7.8	0-3	0	0-2	0
	27-46	18-30	11-20	7.4-8.4	5-35	0-2	0-4	0-2
	46-52	18-35	9-15	7.4-8.4	1-25	0-2	0-8	0-4
	52-80	25-30	9-15	7.4-9.0	1-25	0-2	0-8	0-4
Winship-----	0-18	18-26	25-30	6.6-7.8	0	0	0-2	0
	18-41	26-34	25-30	6.6-7.8	0-1	0	0-2	0
	41-57	24-30	15-20	6.6-8.4	0-10	0-1	0-2	0-2
	57-80	25-30	10-20	7.4-9.0	5-15	0-1	0-4	0-2
Bu:								
Bon-----	0-26	20-27	18-26	6.6-8.4	0-15	0	0-2	0
	26-49	15-30	13-22	7.4-8.4	3-15	0	0-2	0
	49-80	10-30	8-14	7.4-8.4	3-15	1-5	0-2	0-1
Bw:								
Bon, channeled-----	0-26	20-27	18-26	6.6-8.4	0-15	0	0-2	0
	26-49	15-30	13-22	7.4-8.4	3-15	0	0-2	0
	49-80	10-30	8-14	7.4-8.4	3-15	1-5	0-2	0-1
BxD:								
Buse-----	0-7	18-27	11-19	7.4-8.4	1-25	0	0-2	0
	7-35	18-35	10-20	7.4-8.4	15-40	0	0-4	0
	35-80	18-35	9-18	7.4-8.4	10-20	0	0-4	0
Barnes-----	0-7	15-27	10-30	5.6-7.8	0	0	0-2	0
	7-15	18-35	10-30	6.1-7.8	0-3	0	0-4	0
	15-38	18-35	5-25	7.4-8.4	10-30	0-1	0-4	0
	38-80	18-35	5-25	7.4-8.4	10-30	0-1	0-4	0-2
ByE:								
Buse, stony-----	0-7	20-27	10-20	6.6-8.4	0-25	0	0-2	0
	7-35	20-30	15-30	7.4-8.4	15-30	0	0-4	0
	35-80	20-30	15-30	7.4-8.4	10-20	0	0-4	0
Barnes, stony-----	0-7	18-26	15-30	5.6-7.8	0	0	0-2	0
	7-15	18-35	10-15	6.1-7.8	0-5	0	0-4	0
	15-80	18-35	10-15	7.4-8.4	10-30	0-2	0-4	0
BzE:								
Buse-----	0-7	18-27	11-19	7.4-8.4	1-25	0	0-2	0
	7-35	18-35	10-20	7.4-8.4	15-40	0	0-4	0
	35-80	18-35	9-18	7.4-8.4	10-20	0	0-4	0
Langhei-----	0-4	28-35	10-30	6.6-8.4	0-30	0	0-2	0
	4-15	20-35	10-25	7.4-8.4	20-35	0	0-4	0
	15-80	20-35	10-25	7.4-8.4	15-30	0	0-4	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	<i>In</i>	<i>Pct</i>	<i>meq/100 g</i>	<i>pH</i>	<i>Pct</i>	<i>Pct</i>	<i>mmhos/cm</i>	
Ca:								
Camtown-----	0-14	10-18	12-20	5.6-7.3	0	0	0-2	0
	14-19	5-20	5-8	5.6-7.3	0	0	0-2	0
	19-36	18-30	10-14	6.1-8.4	0-5	0	4-8	13-20
	36-48	10-30	8-12	7.4-9.0	10-20	0-10	4-8	5-15
	48-80	5-25	6-9	7.4-9.0	5-20	0-5	4-8	5-15
Turton-----	0-8	10-18	12-20	5.6-7.3	0	0	0-2	0-5
	8-10	5-15	4-6	5.6-7.3	0	0-1	0-2	0-5
	10-24	18-30	10-14	7.4-9.0	5-25	0-5	4-16	15-35
	24-38	10-28	8-12	7.9-9.6	10-30	0-5	4-16	5-15
	38-80	5-25	6-9	7.9-9.0	10-30	0-2	4-16	1-6
Cf:								
Cavour-----	0-9	18-25	20-28	6.1-7.8	0	0	0-2	0-3
	9-22	35-50	30-39	6.6-9.0	0-15	0-3	4-16	2-10
	22-45	25-50	20-32	7.4-9.0	8-25	1-3	8-16	16-21
	45-80	25-35	17-25	7.4-9.0	5-15	1-5	8-16	8-16
Ferney-----	0-3	18-26	11-19	6.1-7.3	0	0	0-2	0-5
	3-16	35-50	17-26	6.6-9.0	0-20	0-5	4-16	13-20
	16-80	35-45	16-24	7.9-9.0	5-30	1-10	4-16	13-22
Co:								
Colvin, saline-----	0-14	27-34	25-35	7.4-8.4	0-10	0-1	4-16	0-2
	14-80	18-34	10-25	7.4-8.4	5-45	0-5	4-16	0-10
Cr:								
Cresbard-----	0-8	20-26	20-25	5.6-7.3	0	0	0-2	0
	8-11	27-40	25-30	5.6-7.3	0	0	2-4	0-5
	11-22	35-50	20-25	6.1-8.4	0-5	0-1	2-4	1-10
	22-38	35-50	15-25	7.4-9.0	10-20	1-5	2-4	5-15
	38-80	25-35	15-20	7.4-9.0	5-20	1-5	2-8	5-15
Cavour-----	0-9	18-25	20-28	6.1-7.8	0	0	0-2	0-3
	9-22	35-50	30-39	6.6-9.0	0-15	0-3	4-16	2-10
	22-45	25-50	20-32	7.4-9.0	8-25	1-3	8-16	16-21
	45-80	25-35	17-25	7.4-9.0	5-15	1-5	8-16	8-16
Cs:								
Cresbard-----	0-8	20-26	20-25	5.6-7.3	0	0	0-2	0
	8-11	27-40	25-30	5.6-7.3	0	0	2-4	0-5
	11-22	35-50	20-25	6.1-8.4	0-5	0-1	2-4	1-10
	22-38	35-50	15-25	7.4-9.0	10-20	1-5	2-4	5-15
	38-80	25-35	15-20	7.4-9.0	5-20	1-5	2-8	5-15
Cavour-----	0-9	18-25	20-28	6.1-7.8	0	0	0-2	0-3
	9-22	35-50	30-39	6.6-9.0	0-15	0-3	4-16	2-10
	22-45	25-50	20-32	7.4-9.0	8-25	1-3	8-16	16-21
	45-80	25-35	17-25	7.4-9.0	5-15	1-5	8-16	8-16
Heil-----	0-2	18-27	15-30	5.6-7.3	0	0	0-2	0
	2-24	45-60	20-35	6.1-9.0	0-5	0-1	4-16	5-20
	24-80	27-50	10-20	7.4-9.0	3-20	0-5	4-16	10-20
Ct:								
Crossplain-----	0-15	23-27	15-30	6.1-7.3	0	0	0-2	0
	15-30	35-45	20-30	6.1-7.3	0	0	0-2	0
	30-59	25-35	15-20	6.6-8.4	1-20	0-2	0-4	0-1
	59-80	25-35	10-20	7.4-8.4	1-10	1-5	2-8	0-2

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
Ct: (cont.)								
Tetonka-----	0-13	20-27	17-30	5.6-7.3	0	0	0-2	0
	13-39	35-60	21-35	6.1-7.8	0-5	0	0-2	0
	39-80	30-50	16-26	6.6-8.4	0-15	0-2	2-8	0-1
Da:								
Davis-----	0-6	18-27	17-25	6.1-7.3	0	0	0-2	0
	6-28	18-30	16-24	6.1-7.8	0	0	0-2	0
	28-80	18-27	11-20	7.4-8.4	5-15	0-5	0-4	0
Northville-----	0-5	20-27	20-35	6.1-7.8	0	0	0-2	0
	5-8	25-35	25-30	6.1-7.8	0	0	0-2	0-3
	8-22	35-50	25-30	6.6-8.4	0-5	0-2	0-4	5-15
	22-58	20-50	25-30	7.4-9.0	10-20	1-5	4-16	5-15
	58-80	28-50	20-25	7.4-9.0	10-20	1-5	4-16	5-10
Db:								
Davison-----	0-8	18-26	13-21	6.6-8.4	5-15	0	0-2	0
	8-28	18-30	10-15	7.4-9.0	15-30	0-5	0-2	0-1
	28-53	18-30	10-15	7.4-8.4	10-20	0-5	2-4	0-2
	53-80	15-30	9-14	7.4-8.4	5-15	0-2	2-8	0-2
Dd:								
Davison-----	0-8	18-26	13-21	6.6-8.4	5-15	0	0-2	0
	8-28	18-30	10-15	7.4-9.0	15-30	0-5	0-2	0-1
	28-53	18-30	10-15	7.4-8.4	10-20	0-5	2-4	0-2
	53-80	15-30	9-14	7.4-8.4	5-15	0-2	2-8	0-2
Tetonka-----	0-13	20-27	17-30	5.6-7.3	0	0	0-2	0
	13-39	35-60	21-35	6.1-7.8	0-5	0	0-2	0
	39-80	30-50	16-26	6.6-8.4	0-15	0-2	2-8	0-1
DeA:								
Delmont-----	0-7	20-27	13-22	6.1-7.8	0	0	0-2	0
	7-16	18-30	12-19	6.1-7.8	0-5	0	0-2	0
	16-80	0-5	1-3	7.4-8.4	1-10	0	0-2	0
Enet-----	0-7	20-27	25-30	5.6-7.3	0	0	0-2	0
	7-15	18-30	20-30	6.6-7.8	0	0	0-2	0
	15-28	15-30	15-20	6.6-8.4	0-10	0	0-2	0
	28-80	0-5	5-15	7.4-8.4	0-10	0	0-2	0
Dk:								
Dimo-----	0-7	20-26	17-26	5.6-7.3	0	0	0-2	0
	7-31	20-34	12-22	6.1-7.8	0-25	0	0-2	0
	31-80	5-10	3-6	7.4-8.4	0-20	0	0-2	0
Dm:								
Dimo-----	0-7	20-26	17-26	5.6-7.3	0	0	0-2	0
	7-31	20-34	12-22	6.1-7.8	0-25	0	0-2	0
	31-80	5-10	3-6	7.4-8.4	0-20	0	0-2	0
Grat-----	0-9	20-26	23-28	6.1-7.3	0	0	0-2	0
	9-27	35-50	27-35	6.6-8.4	2-40	0	0-4	0-2
	27-57	3-7	3-10	7.4-8.4	1-15	0-1	0-2	0-2
	57-80	25-35	17-25	7.4-8.4	5-15	1-3	0-2	0-2
DoA:								
Doland-----	0-7	18-26	15-25	6.1-7.3	0	0	0-2	0
	7-28	18-26	10-20	6.1-7.3	0-15	0	0-2	0
	28-80	18-30	5-15	7.4-8.4	5-20	0-5	0-4	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
DoA: (cont.)								
Embden-----	0-15	10-18	10-25	6.6-7.3	0	0	0	0
	15-38	10-18	5-20	6.6-7.8	0	0	0	0
	38-80	5-18	2-15	6.6-8.4	0-15	0	0-2	0
Dq:								
Dovecreek-----	0-16	20-27	20-28	6.1-7.8	0-10	0	0	0
	16-30	25-35	20-30	6.6-8.4	5-15	0	0-4	0
	30-80	25-35	15-25	7.4-8.4	5-15	0	0-4	0
Dr:								
Dovray-----	0-16	40-60	30-50	6.1-7.8	0	0	0	0
	16-40	40-60	20-30	6.1-7.8	0-3	0	0-2	0
	40-60	25-60	20-30	6.6-8.4	0-15	0	0-4	0
Du:								
Dudley-----	0-7	18-25	12-21	5.6-7.3	0	0	0-2	0-5
	7-18	35-50	17-26	6.1-8.4	0-5	0	4-8	10-20
	18-39	30-50	16-24	7.4-9.0	1-20	1-5	8-16	3-10
	39-80	20-35	11-17	7.4-9.0	1-15	1-5	8-16	3-15
Jerauld-----	0-2	15-25	20-30	5.6-7.3	0	0	0-4	0-5
	2-14	35-60	20-40	6.6-8.4	0-5	0-5	2-8	10-25
	14-33	35-60	20-35	7.9-9.0	0-5	1-5	4-16	5-20
	33-80	27-45	20-35	7.4-9.0	5-20	1-5	4-16	5-20
Dx:								
Durrstein-----	0-2	10-26	9-17	6.1-7.3	0-1	0-2	4-16	0-5
	2-14	35-60	21-33	6.6-9.0	1-10	5-10	4-16	13-25
	14-80	35-55	18-28	7.4-9.6	1-20	5-10	4-16	13-25
Ea:								
Eckman-----	0-7	12-18	10-25	6.6-7.8	0-3	0	0	0
	7-39	10-18	5-20	6.6-8.4	0-15	0	0	0
	39-80	10-18	5-20	7.4-8.4	0-15	0	0-2	0
EcA:								
Eckman-----	0-7	12-18	10-25	6.6-7.8	0-3	0	0	0
	7-39	10-18	5-20	6.6-8.4	0-15	0	0	0
	39-80	10-18	5-20	7.4-8.4	0-15	0	0-2	0
Gardena-----	0-20	12-18	10-25	6.6-7.8	0-3	0	0	0
	20-80	10-18	5-15	7.4-8.4	0-15	0-2	0-2	0-2
EcB:								
Eckman-----	0-7	12-18	10-25	6.6-7.8	0-3	0	0	0
	7-39	10-18	5-20	6.6-8.4	0-15	0	0	0
	39-80	10-18	5-20	7.4-8.4	0-15	0	0-2	0
Gardena-----	0-20	12-18	10-25	6.6-7.8	0-3	0	0	0
	20-80	10-18	5-15	7.4-8.4	0-15	0-2	0-2	0-2
EdB:								
Eckman-----	0-7	12-18	10-25	6.6-7.8	0-3	0	0	0
	7-39	10-18	5-20	6.6-8.4	0-15	0	0	0
	39-80	10-18	5-20	7.4-8.4	0-15	0	0-2	0
Zell-----	0-7	12-18	10-25	6.6-7.8	0-3	0	0	0
	7-31	10-18	10-20	7.4-8.4	15-30	0	0-2	0
	31-80	5-18	10-20	7.4-9.0	10-25	0-1	0-4	0-3

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	<i>In</i>	<i>Pct</i>	<i>meq/100 g</i>	<i>pH</i>	<i>Pct</i>	<i>Pct</i>	<i>mmhos/cm</i>	
EeB:								
Edgeley-----	0-8	18-26	15-27	6.1-7.3	0	0	0	0
	8-25	18-34	10-16	6.1-8.4	0-15	0	0	0
	25-80	---	---	---	---	---	---	---
EeC:								
Edgeley-----	0-8	18-26	15-27	6.1-7.3	0	0	0	0
	8-25	18-34	10-16	6.1-8.4	0-15	0	0	0
	25-80	---	---	---	---	---	---	---
EeD:								
Edgeley-----	0-8	18-26	15-27	6.1-7.3	0	0	0	0
	8-25	18-34	10-16	6.1-8.4	0-15	0	0	0
	25-80	---	---	---	---	---	---	---
EgA:								
Egeland-----	0-8	10-18	15-20	5.6-7.3	0	0	0-2	0
	8-31	10-18	15-20	6.1-7.8	0	0	0-2	0
	31-64	5-10	5-15	6.6-8.4	5-20	0	0-2	0
	64-80	6-14	15-20	7.4-8.4	5-20	0	0-2	0
Embden-----	0-15	10-18	10-25	6.6-7.3	0	0	0	0
	15-38	10-18	5-20	6.6-7.8	0	0	0	0
	38-80	5-18	2-15	6.6-8.4	0-15	0	0-2	0
EgB:								
Egeland-----	0-8	10-18	15-20	5.6-7.3	0	0	0-2	0
	8-31	10-18	15-20	6.1-7.8	0	0	0-2	0
	31-64	5-10	5-15	6.6-8.4	5-20	0	0-2	0
	64-80	6-14	15-20	7.4-8.4	5-20	0	0-2	0
Embden-----	0-15	10-18	10-25	6.6-7.3	0	0	0	0
	15-38	10-18	5-20	6.6-7.8	0	0	0	0
	38-80	5-18	2-15	6.6-8.4	0-15	0	0-2	0
Ek:								
Elsmere-----	0-19	3-10	2-10	5.6-7.8	0	0	0	0
	19-46	0-5	0-5	5.6-7.8	0	0	0	0
	46-80	12-30	8-22	7.4-8.4	1-5	0	0-2	0
EmE:								
Ethan-----	0-8	20-27	12-20	6.6-8.4	5-15	0	0-2	0
	8-20	18-30	10-15	7.4-8.4	15-35	0	0-2	0
	20-32	18-30	10-15	7.4-8.4	10-25	0-2	2-4	0-2
	32-60	18-30	10-15	7.4-9.0	10-25	0-5	2-4	0-2
Betts-----	0-3	18-27	11-20	6.6-8.4	5-25	0	0-2	0
	3-29	20-35	11-17	7.4-8.4	10-30	0	0-2	0
	29-80	20-35	11-17	7.4-8.4	10-30	0-2	2-4	0-1
EnD:								
Ethan-----	0-8	20-27	12-20	6.6-8.4	5-15	0	0-2	0
	8-20	18-30	10-15	7.4-8.4	15-35	0	0-2	0
	20-32	18-30	10-15	7.4-8.4	10-25	0-2	2-4	0-2
	32-60	18-30	10-15	7.4-9.0	10-25	0-5	2-4	0-2
Hand-----	0-7	20-27	13-22	5.6-7.8	0	0	0-2	0
	7-18	20-27	9-20	6.1-7.8	0-2	0	0-2	0
	18-35	18-30	10-15	7.4-8.4	5-20	0-1	0-4	0-1
	35-80	18-30	10-15	7.4-8.4	5-15	0-2	2-4	0-1

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
Er:								
Exline-----	0-2	20-26	11-20	6.1-7.8	0	0	0-2	0
	2-21	35-55	18-27	6.6-9.0	0-15	0-2	4-16	5-20
	21-40	35-50	17-26	7.9-9.0	3-20	0-10	4-8	5-20
	40-80	25-35	12-18	7.9-9.0	3-20	0-5	2-8	5-15
Aberdeen-----	0-13	20-33	25-30	5.6-7.3	0	0	0-2	0
	13-23	35-55	30-35	6.6-8.4	0-10	0	0-4	0-10
	23-39	30-55	25-35	7.4-9.0	10-20	0-10	2-8	5-15
	39-80	10-26	15-35	7.4-9.0	5-15	0-5	2-8	5-15
Nahon-----	0-7	23-26	20-30	5.6-7.3	0	0	0-2	0-3
	7-9	20-30	20-30	5.6-7.3	0	0	0-2	0-3
	9-21	35-55	30-40	6.6-9.0	0	0	0-2	0-10
	21-43	23-55	25-35	7.4-9.0	10-20	0-5	4-16	5-15
	43-49	30-60	20-35	7.9-9.0	10-20	0-5	4-16	5-20
	49-80	25-30	10-20	7.4-9.0	5-15	0-5	2-8	5-15
Et:								
Exline-----	0-2	20-26	11-20	6.1-7.8	0	0	0-2	0
	2-24	35-55	18-27	6.6-9.0	0-15	0-2	4-16	5-20
	24-39	35-50	17-26	7.9-9.0	3-20	0-10	4-8	5-20
	39-55	25-35	12-18	7.9-9.0	3-20	0-5	2-8	5-15
	55-80	25-30	10-20	7.4-9.0	5-15	0-5	2-8	5-15
Aberdeen-----	0-11	20-26	25-28	5.6-7.3	0	0	0-2	0
	11-23	35-55	30-35	6.6-8.4	0-10	0	0-4	0-10
	23-36	30-55	25-35	7.4-9.0	10-20	0-5	2-8	5-15
	36-49	10-30	15-35	7.4-9.0	5-15	0-5	2-8	5-15
	49-80	25-30	10-20	7.4-9.0	5-15	0-5	2-8	5-15
Nahon-----	0-7	23-26	20-30	5.6-7.3	0	0	0-2	0-3
	7-9	20-30	20-30	5.6-7.3	0	0	0-2	0-3
	9-21	35-55	30-40	6.6-9.0	0	0	0-2	0-10
	21-43	23-55	25-35	7.4-9.0	10-20	0-5	4-16	5-15
	43-49	30-60	20-35	7.9-9.0	10-20	0-5	4-16	5-20
	49-80	25-30	10-20	7.4-9.0	5-15	0-5	2-8	5-15
Ew:								
Exline-----	0-2	20-26	11-20	6.1-7.8	0	0	0-2	0
	2-21	35-55	18-27	6.6-9.0	0-15	0-2	4-16	5-20
	21-40	35-50	17-26	7.9-9.0	3-20	0-10	4-8	5-20
	40-80	25-35	12-18	7.9-9.0	3-20	0-5	2-8	5-15
Heil-----	0-2	18-27	15-30	5.6-7.3	0	0	0-2	0
	2-24	45-60	20-35	6.1-9.0	0-5	0-1	4-16	5-20
	24-80	27-50	10-20	7.4-9.0	3-20	0-5	4-16	10-20
Ex:								
Exline-----	0-2	20-26	11-20	6.1-7.8	0	0	0-2	0
	2-24	35-55	18-27	6.6-9.0	0-15	0-2	4-16	5-20
	24-39	35-50	17-26	7.9-9.0	3-20	0-10	4-8	5-20
	39-55	25-35	12-18	7.9-9.0	3-20	0-5	2-8	5-15
	55-80	25-30	10-20	7.4-9.0	5-15	0-5	2-8	5-15
Heil-----	0-2	18-27	15-30	5.6-7.3	0	0	0-2	0
	2-24	45-60	20-35	6.1-9.0	0-5	0-1	4-16	5-20
	24-47	27-50	10-20	7.4-9.0	3-20	0-5	4-16	10-20
	47-80	27-50	10-20	7.4-9.0	3-20	0-5	4-16	10-20

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
EyA:								
Exline-----	0-2	20-26	11-20	6.1-7.8	0	0	0-2	0
	2-21	35-55	18-27	6.6-9.0	0-15	0-2	4-16	5-20
	21-40	35-50	17-26	7.9-9.0	3-20	0-10	4-8	5-20
	40-80	25-35	12-18	7.9-9.0	3-20	0-5	2-8	5-15
Putney-----	0-7	20-26	13-26	6.1-7.8	0	0	0-2	0-1
	7-15	18-30	12-22	6.6-8.4	0-5	0-2	0-4	0-5
	15-37	20-45	15-25	7.4-9.0	10-40	2-25	8-16	1-6
	37-80	18-25	10-17	7.4-9.0	10-30	0-5	4-16	1-6
Fa:								
Farmsworth-----	0-8	20-27	15-20	5.6-7.3	0	0	0-2	0-5
	8-25	35-60	20-30	6.1-8.4	0-5	0-1	4-16	5-20
	25-43	35-55	20-30	7.4-9.0	1-30	1-10	4-16	2-20
	43-80	25-35	10-20	7.4-9.0	3-15	1-10	4-16	2-15
Durrstein-----	0-2	10-26	9-17	6.1-7.3	0-1	0-2	4-16	0-5
	2-14	35-60	21-33	6.6-9.0	1-10	5-10	4-16	13-25
	14-80	35-55	18-28	7.4-9.6	1-20	5-10	4-16	13-25
Fe:								
Ferney-----	0-3	18-26	11-19	6.1-7.3	0	0	0-2	0-5
	3-16	35-50	17-26	6.6-9.0	0-20	0-5	4-16	13-20
	16-80	35-45	16-24	7.9-9.0	5-30	1-10	4-16	13-22
Heil-----	0-2	18-27	15-30	5.6-7.3	0	0	0-2	0
	2-24	45-60	20-35	6.1-9.0	0-5	0-1	4-16	5-20
	24-80	27-50	10-20	7.4-9.0	3-20	0-5	4-16	10-20
Ff:								
Forestburg-----	0-7	5-10	5-10	6.1-7.3	0	0	0-2	0
	7-36	5-10	4-10	6.1-7.8	0-3	0	0-2	0
	36-53	20-30	10-15	7.4-8.4	3-25	0	0-2	0
	53-80	15-25	10-15	7.4-8.4	3-20	0	0-2	0
Elsmere-----	0-19	3-10	2-10	5.6-7.8	0	0	0	0
	19-46	0-5	0-5	5.6-7.8	0	0	0	0
	46-80	12-30	8-22	7.4-8.4	1-5	0	0-2	0
Fh:								
Forestburg-----	0-7	5-10	5-10	6.1-7.3	0	0	0-2	0
	7-36	5-10	4-10	6.1-7.8	0-3	0	0-2	0
	36-53	20-30	10-15	7.4-8.4	3-25	0	0-2	0
	53-80	15-25	10-15	7.4-8.4	3-20	0	0-2	0
Elsmere-----	0-19	3-10	2-10	5.6-7.8	0	0	0	0
	19-46	0-5	0-5	5.6-7.8	0	0	0	0
	46-80	12-30	8-22	7.4-8.4	1-5	0	0-2	0
Toko-----	0-8	5-15	7-13	5.6-7.3	0	0	0-2	0
	8-11	5-10	3-6	5.6-7.8	0	0	0-2	0
	11-28	18-35	10-15	6.1-7.8	0-5	0	0-2	0-1
	28-56	5-20	8-16	7.4-9.0	5-20	0-2	0-4	0-1
	56-80	15-30	9-14	7.4-9.0	5-20	0-2	0-4	0-1
FmA:								
Forman-----	0-8	18-27	15-30	6.6-7.8	0	0	0-2	0
	8-15	30-35	10-20	6.6-7.8	0-15	0	0-2	0
	15-80	18-35	10-20	7.4-8.4	5-30	0-2	0-4	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
FmA: (cont.)								
Aastad-----	0-14	24-27	18-28	6.1-7.8	0	0	0	0
	14-29	28-35	15-31	6.6-7.8	0-1	0	0-2	0
	29-80	24-35	10-25	7.4-8.4	5-30	0-1	0-4	0
FmB:								
Forman-----	0-8	18-27	15-30	6.6-7.8	0	0	0-2	0
	8-15	30-35	10-20	6.6-7.8	0-15	0	0-2	0
	15-80	18-35	10-20	7.4-8.4	5-30	0-2	0-4	0
Aastad-----	0-14	24-27	18-28	6.1-7.8	0	0	0	0
	14-29	28-35	15-31	6.6-7.8	0-1	0	0-2	0
	29-80	24-35	10-25	7.4-8.4	5-30	0-1	0-4	0
FnC:								
Forman-----	0-8	18-27	15-30	6.6-7.8	0	0	0-2	0
	8-15	30-35	10-20	6.6-7.8	0-15	0	0-2	0
	15-80	18-35	10-20	7.4-8.4	5-30	0-2	0-4	0
Buse-----	0-7	18-27	11-19	7.4-8.4	1-25	0	0-2	0
	7-35	18-35	10-20	7.4-8.4	15-40	0	0-4	0
	35-80	18-35	9-18	7.4-8.4	10-20	0	0-4	0
FrB:								
Forman-----	0-8	18-27	15-30	6.6-7.8	0	0	0-2	0
	8-15	30-35	10-20	6.6-7.8	0-15	0	0-2	0
	15-80	18-35	10-20	7.4-8.4	5-30	0-2	0-4	0
Buse-----	0-7	18-27	11-19	7.4-8.4	1-25	0	0-2	0
	7-35	18-35	10-20	7.4-8.4	15-40	0	0-4	0
	35-80	18-35	9-18	7.4-8.4	10-20	0	0-4	0
Aastad-----	0-14	24-27	18-28	6.1-7.8	0	0	0	0
	14-29	28-35	15-31	6.6-7.8	0-1	0	0-2	0
	29-80	24-35	10-25	7.4-8.4	5-30	0-1	0-4	0
FrC:								
Forman-----	0-8	18-27	15-30	6.6-7.8	0	0	0-2	0
	8-15	30-35	10-20	6.6-7.8	0-15	0	0-2	0
	15-80	18-35	10-20	7.4-8.4	5-30	0-2	0-4	0
Buse-----	0-7	18-27	11-19	7.4-8.4	1-25	0	0-2	0
	7-35	18-35	10-20	7.4-8.4	15-40	0	0-4	0
	35-80	18-35	9-18	7.4-8.4	10-20	0	0-4	0
Aastad-----	0-14	24-27	18-28	6.1-7.8	0	0	0	0
	14-29	28-35	15-31	6.6-7.8	0-1	0	0-2	0
	29-80	24-35	10-25	7.4-8.4	5-30	0-1	0-4	0
FsA:								
Forman-----	0-8	18-27	15-30	6.6-7.8	0	0	0-2	0
	8-15	30-35	10-20	6.6-7.8	0-15	0	0-2	0
	15-80	18-35	10-20	7.4-8.4	5-30	0-2	0-4	0
Cresbard-----	0-8	20-26	20-25	5.6-7.3	0	0	0-2	0
	8-11	27-40	25-30	5.6-7.3	0	0	2-4	0-5
	11-22	35-50	20-25	6.1-8.4	0-5	0-1	2-4	1-10
	22-38	35-50	15-25	7.4-9.0	10-20	1-5	2-4	5-15
	38-80	25-35	15-20	7.4-9.0	5-20	1-5	2-8	5-15

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
FsB:								
Forman-----	0-8	18-27	15-30	6.6-7.8	0	0	0-2	0
	8-15	30-35	10-20	6.6-7.8	0-15	0	0-2	0
	15-80	18-35	10-20	7.4-8.4	5-30	0-2	0-4	0
Cresbard-----	0-8	20-26	20-25	5.6-7.3	0	0	0-2	0
	8-11	27-40	25-30	5.6-7.3	0	0	2-4	0-5
	11-22	35-50	20-25	6.1-8.4	0-5	0-1	2-4	1-10
	22-38	35-50	15-25	7.4-9.0	10-20	1-5	2-4	5-15
	38-80	25-35	15-20	7.4-9.0	5-20	1-5	2-8	5-15
FtA:								
Forman-----	0-8	18-27	15-30	6.6-7.8	0	0	0-2	0
	8-15	30-35	10-20	6.6-7.8	0-15	0	0-2	0
	15-80	18-35	10-20	7.4-8.4	5-30	0-2	0-4	0
Cresbard-----	0-8	20-26	20-25	5.6-7.3	0	0	0-2	0
	8-11	27-40	25-30	5.6-7.3	0	0	2-4	0-5
	11-22	35-50	20-25	6.1-8.4	0-5	0-1	2-4	1-10
	22-38	35-50	15-25	7.4-9.0	10-20	1-5	2-4	5-15
	38-80	25-35	15-20	7.4-9.0	5-20	1-5	2-8	5-15
Tonka-----	0-16	18-27	15-35	5.6-7.8	0	0	0	0
	16-41	35-50	15-35	5.6-7.8	0-1	0-1	0-2	0-1
	41-80	27-39	10-25	6.6-8.4	5-20	0-2	0-4	0-2
Ga:								
Gardena-----	0-20	12-18	10-25	6.6-7.8	0-3	0	0	0
	20-80	10-18	5-15	7.4-8.4	0-15	0-2	0-2	0-2
Gd:								
Gardena-----	0-20	12-18	10-25	6.6-7.8	0-3	0	0	0
	20-80	10-18	5-15	7.4-8.4	0-15	0-2	0-2	0-2
Glyndon-----	0-12	15-27	12-28	7.4-9.0	15-25	0	0-4	0
	12-46	10-18	6-14	7.4-9.0	20-40	0	0-4	0
	46-80	5-18	2-10	7.4-9.0	15-35	0	0-4	0
Ge:								
Gardena-----	0-20	12-18	10-25	6.6-7.8	0-3	0	0	0
	20-80	10-18	5-15	7.4-8.4	0-15	0-2	0-2	0-2
Turton-----	0-8	5-10	9-17	5.6-7.3	0	0	0-2	0-5
	8-10	5-15	4-6	5.6-7.3	0	0-1	0-2	0-5
	10-24	18-30	10-14	7.4-9.0	5-25	0-5	4-16	15-35
	24-38	10-28	8-12	7.9-9.6	10-30	0-5	4-16	5-15
	38-80	5-25	6-9	7.9-9.0	10-30	0-2	4-16	1-6
GgA:								
Great Bend-----	0-7	20-26	13-22	6.1-7.8	0	0	0-2	0
	7-12	18-30	12-20	6.6-8.4	0-5	0	0-2	0
	12-32	18-30	10-16	7.4-8.4	10-25	0	0-2	0
	32-53	18-25	9-14	7.4-8.4	10-25	0-2	0-4	0
	53-80	18-25	9-14	7.4-8.4	10-25	0-2	0-8	0
GnA:								
Great Bend-----	0-7	20-26	13-22	6.1-7.8	0	0	0-2	0
	7-12	18-30	12-20	6.6-8.4	0-5	0	0-2	0
	12-32	18-30	10-16	7.4-8.4	10-25	0	0-2	0
	32-53	18-25	9-14	7.4-8.4	10-25	0-2	0-4	0
	53-80	18-25	9-14	7.4-8.4	10-25	0-2	0-8	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
GnA: (cont.)								
Beotia-----	0-9	20-27	17-30	6.1-7.8	0	0	0-2	0
	9-21	18-30	10-14	6.1-7.8	0-3	0	0-2	0
	21-39	18-30	10-14	7.4-8.4	5-35	0-2	0-4	0-2
	39-80	18-35	10-14	7.4-8.4	1-25	0-2	0-8	0-4
GnB:								
Great Bend-----	0-7	20-26	13-22	6.1-7.8	0	0	0-2	0
	7-12	18-30	12-20	6.6-8.4	0-5	0	0-2	0
	12-32	18-30	10-16	7.4-8.4	10-25	0	0-2	0
	32-53	18-25	9-14	7.4-8.4	10-25	0-2	0-4	0
	53-80	18-25	9-14	7.4-8.4	10-25	0-2	0-8	0
Beotia-----	0-9	20-27	17-30	6.1-7.8	0	0	0-2	0
	9-21	18-30	10-14	6.1-7.8	0-3	0	0-2	0
	21-39	18-30	10-14	7.4-8.4	5-35	0-2	0-4	0-2
	39-80	18-35	10-14	7.4-8.4	1-25	0-2	0-8	0-4
GoA:								
Great Bend-----	0-7	20-26	13-22	6.1-7.8	0	0	0-2	0
	7-14	18-30	12-20	6.6-8.4	10-30	0	0-2	0
	14-29	18-30	10-16	7.4-8.4	10-25	0	0-2	0
	29-49	18-25	9-14	7.4-8.4	10-25	0-2	0-4	0-2
	49-80	25-30	9-14	7.4-8.4	10-25	0-2	0-8	0-2
Beotia-----	0-12	20-27	17-30	6.1-7.8	0	0	0-2	0
	12-27	18-30	14-22	6.1-7.8	0-3	0	0-2	0
	27-46	18-30	11-20	7.4-8.4	5-35	0-2	0-4	0-2
	46-52	18-35	9-15	7.4-8.4	1-25	0-2	0-8	0-4
	52-80	25-30	9-15	7.4-9.0	1-25	0-2	0-8	0-4
GpA:								
Great Bend-----	0-7	20-26	13-22	6.1-7.8	0	0	0-2	0
	7-12	18-30	12-20	6.6-8.4	0-5	0	0-2	0
	12-32	18-30	10-16	7.4-8.4	10-25	0	0-2	0
	32-53	18-25	9-14	7.4-8.4	10-25	0-2	0-4	0
	53-80	18-25	9-14	7.4-8.4	10-25	0-2	0-8	0
Putney-----	0-7	20-26	13-26	6.1-7.8	0	0	0-2	0-1
	7-15	18-30	12-22	6.6-8.4	0-5	0-2	0-4	0-5
	15-37	20-45	15-25	7.4-9.0	10-40	2-25	8-16	1-6
	37-80	18-25	10-17	7.4-9.0	10-30	0-5	4-16	1-6
GpB:								
Great Bend-----	0-7	20-26	13-22	6.1-7.8	0	0	0-2	0
	7-12	18-30	12-20	6.6-8.4	0-5	0	0-2	0
	12-32	18-30	10-16	7.4-8.4	10-25	0	0-2	0
	32-53	18-25	9-14	7.4-8.4	10-25	0-2	0-4	0
	53-80	18-25	9-14	7.4-8.4	10-25	0-2	0-8	0
Putney-----	0-7	20-26	13-26	6.1-7.8	0	0	0-2	0-1
	7-15	18-30	12-22	6.6-8.4	0-5	0-2	0-4	0-5
	15-37	20-45	15-25	7.4-9.0	10-40	2-25	8-16	1-6
	37-80	18-25	10-17	7.4-9.0	10-30	0-5	4-16	1-6
GtB:								
Great Bend-----	0-7	20-26	13-22	6.1-7.8	0	0	0-2	0
	7-12	18-30	12-20	6.6-8.4	0-5	0	0-2	0
	12-32	18-30	10-16	7.4-8.4	10-25	0	0-2	0
	32-53	18-25	9-14	7.4-8.4	10-25	0-2	0-4	0
	53-80	18-25	9-14	7.4-8.4	10-25	0-2	0-8	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
GtB: (cont.)								
Zell-----	0-7	10-18	15-25	6.6-8.4	0-5	0	0-2	0
	7-31	10-18	10-20	7.4-8.4	15-30	0	0-2	0
	31-80	5-18	10-20	7.4-9.0	10-25	0-1	0-4	0-3
GtC:								
Great Bend-----	0-7	20-26	13-22	6.1-7.8	0	0	0-2	0
	7-12	18-30	12-20	6.6-8.4	0-5	0	0-2	0
	12-32	18-30	10-16	7.4-8.4	10-25	0	0-2	0
	32-53	18-25	9-14	7.4-8.4	10-25	0-2	0-4	0
	53-80	18-25	9-14	7.4-8.4	10-25	0-2	0-8	0
Zell-----	0-7	10-18	15-25	6.6-8.4	0-5	0	0-2	0
	7-31	10-18	10-20	7.4-8.4	15-30	0	0-2	0
	31-80	5-18	10-20	7.4-9.0	10-25	0-1	0-4	0-3
GzC:								
Great Bend-----	0-7	20-26	13-22	6.1-7.8	0	0	0-2	0
	7-12	18-30	12-20	6.6-8.4	0-5	0	0-2	0
	12-32	18-30	10-16	7.4-8.4	10-25	0	0-2	0
	32-53	18-25	9-14	7.4-8.4	10-25	0-2	0-4	0
	53-80	18-25	9-14	7.4-8.4	10-25	0-2	0-8	0
Zell-----	0-7	10-18	15-25	6.6-8.4	0-5	0	0-2	0
	7-31	10-18	10-20	7.4-8.4	15-30	0	0-2	0
	31-80	5-18	10-20	7.4-9.0	10-25	0-1	0-4	0-3
Huffton-----	0-7	10-18	10-16	6.6-8.4	0-10	0-2	0-2	0-2
	7-28	15-30	9-14	7.4-9.0	15-40	4-20	4-16	1-10
	28-80	10-25	7-11	7.9-9.0	5-30	0-5	4-8	1-10
HaA:								
Hamerly-----	0-9	18-27	15-30	6.6-8.4	0-10	0	0-2	0
	9-29	18-35	10-20	7.4-8.4	15-35	0-2	0-4	0-2
	29-80	18-35	10-20	7.4-8.4	10-30	0-2	0-4	0-2
Hb:								
Hamerly-----	0-9	18-27	15-30	6.6-8.4	0-10	0	0-2	0
	9-29	18-35	10-20	7.4-8.4	15-35	0-2	0-4	0-2
	29-80	18-35	10-20	7.4-8.4	10-30	0-2	0-4	0-2
Tonka-----	0-16	18-27	15-35	5.6-7.8	0	0	0	0
	16-41	35-50	15-35	5.6-7.8	0-1	0-1	0-2	0-1
	41-80	27-39	10-25	6.6-8.4	5-20	0-2	0-4	0-2
HcA:								
Hand-----	0-7	20-27	13-22	5.6-7.8	0	0	0-2	0
	7-18	20-27	9-20	6.1-7.8	0-2	0	0-2	0
	18-35	18-30	10-15	7.4-8.4	5-20	0-1	0-4	0-1
	35-80	18-30	10-15	7.4-8.4	5-15	0-2	2-4	0-1
Bonilla-----	0-8	20-27	25-30	5.6-7.3	0	0	0-2	0
	8-27	18-30	15-25	6.1-7.8	0	0	0-2	0
	27-47	18-30	10-20	7.4-8.4	10-20	0-2	0-4	0-2
	47-80	18-30	10-20	7.4-8.4	10-20	0-1	0-4	0-1
HcB:								
Hand-----	0-7	20-27	13-22	5.6-7.8	0	0	0-2	0
	7-18	20-27	9-20	6.1-7.8	0-2	0	0-2	0
	18-35	18-30	10-15	7.4-8.4	5-20	0-1	0-4	0-1
	35-80	18-30	10-15	7.4-8.4	5-15	0-2	2-4	0-1

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
HcB: (cont.)								
Bonilla-----	0-8	20-27	25-30	5.6-7.3	0	0	0-2	0
	8-27	18-30	15-25	6.1-7.8	0	0	0-2	0
	27-47	18-30	10-20	7.4-8.4	10-20	0-2	0-4	0-2
	47-80	18-30	10-20	7.4-8.4	10-20	0-1	0-4	0-1
HdA:								
Hand-----	0-7	10-20	9-17	6.1-7.3	0	0	0-2	0
	7-18	20-27	9-20	6.1-7.8	0-2	0	0-2	0
	18-35	18-30	10-15	7.4-8.4	5-20	0-1	0-4	0-1
	35-80	18-30	10-15	7.4-8.4	5-15	0-2	2-4	0-1
Carthage-----	0-7	15-20	9-17	6.1-7.3	0	0	0-2	0
	7-24	10-18	6-9	6.1-8.4	0	0	0-2	0
	24-80	20-30	10-15	7.4-8.4	1-20	0-2	2-4	0-1
He:								
Hand-----	0-7	10-20	9-17	6.1-7.3	0	0	0-2	0
	7-18	20-27	9-20	6.1-7.8	0-2	0	0-2	0
	18-35	18-30	10-15	7.4-8.4	5-20	0-1	0-4	0-1
	35-80	18-30	10-15	7.4-8.4	5-15	0-2	2-4	0-1
Carthage-----	0-7	15-20	9-17	6.1-7.3	0	0	0-2	0
	7-24	10-18	6-9	6.1-8.4	0	0	0-2	0
	24-80	20-30	10-15	7.4-8.4	1-20	0-2	2-4	0-1
Overshue-----	0-7	10-18	10-25	6.1-7.8	0	0	0	0
	7-42	5-18	5-15	6.6-7.8	0-5	0	0	0-1
	42-80	20-30	10-15	7.4-8.4	5-20	0-2	0-4	0-1
HfC:								
Hand-----	0-7	20-27	13-22	5.6-7.8	0	0	0-2	0
	7-18	20-27	9-20	6.1-7.8	0-2	0	0-2	0
	18-35	18-30	10-15	7.4-8.4	5-20	0-1	0-4	0-1
	35-80	18-30	10-15	7.4-8.4	5-15	0-2	2-4	0-1
Ethan-----	0-8	20-27	12-20	6.6-8.4	5-15	0	0-2	0
	8-20	18-30	10-15	7.4-8.4	15-35	0	0-2	0
	20-32	18-30	10-15	7.4-8.4	10-25	0-2	2-4	0-2
	32-60	18-30	10-15	7.4-9.0	10-25	0-5	2-4	0-2
HgB:								
Hand-----	0-7	20-27	13-22	5.6-7.8	0	0	0-2	0
	7-18	20-27	9-20	6.1-7.8	0-2	0	0-2	0
	18-35	18-30	10-15	7.4-8.4	5-20	0-1	0-4	0-1
	35-80	18-30	10-15	7.4-8.4	5-15	0-2	2-4	0-1
Ethan-----	0-8	20-27	12-20	6.6-8.4	5-15	0	0-2	0
	8-20	18-30	10-15	7.4-8.4	15-35	0	0-2	0
	20-32	18-30	10-15	7.4-8.4	10-25	0-2	2-4	0-2
	32-60	18-30	10-15	7.4-9.0	10-25	0-5	2-4	0-2
Bonilla-----	0-8	20-27	25-30	5.6-7.3	0	0	0-2	0
	8-27	18-30	15-25	6.1-7.8	0	0	0-2	0
	27-47	18-30	10-20	7.4-8.4	10-20	0-2	0-4	0-2
	47-80	18-30	10-20	7.4-8.4	10-20	0-1	0-4	0-1

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
HgC:								
Hand-----	0-7	20-27	13-22	5.6-7.8	0	0	0-2	0
	7-18	20-27	9-20	6.1-7.8	0-2	0	0-2	0
	18-35	18-30	10-15	7.4-8.4	5-20	0-1	0-4	0-1
	35-80	18-30	10-15	7.4-8.4	5-15	0-2	2-4	0-1
Ethan-----	0-8	20-27	12-20	6.6-8.4	5-15	0	0-2	0
	8-20	18-30	10-15	7.4-8.4	15-35	0	0-2	0
	20-32	18-30	10-15	7.4-8.4	10-25	0-2	2-4	0-2
	32-60	18-30	10-15	7.4-9.0	10-25	0-5	2-4	0-2
Bonilla-----	0-8	20-27	25-30	5.6-7.3	0	0	0-2	0
	8-27	18-30	15-25	6.1-7.8	0	0	0-2	0
	27-47	18-30	10-20	7.4-8.4	10-20	0-2	0-4	0-2
	47-80	18-30	10-20	7.4-8.4	10-20	0-1	0-4	0-1
HhB:								
Hand-----	0-7	10-20	9-17	6.1-7.3	0	0	0-2	0
	7-18	20-27	9-20	6.1-7.8	0-2	0	0-2	0
	18-35	18-30	10-15	7.4-8.4	5-20	0-1	0-4	0-1
	35-80	18-30	10-15	7.4-8.4	5-15	0-2	2-4	0-1
Ethan-----	0-8	20-27	12-20	6.6-8.4	5-15	0	0-2	0
	8-20	18-30	10-15	7.4-8.4	15-35	0	0-2	0
	20-32	18-30	10-15	7.4-8.4	10-25	0-2	2-4	0-2
	32-60	18-30	10-15	7.4-9.0	10-25	0-5	2-4	0-2
Carthage-----	0-7	15-20	9-17	6.1-7.3	0	0	0-2	0
	7-24	10-18	6-9	6.1-8.4	0	0	0-2	0
	24-80	20-30	10-15	7.4-8.4	1-20	0-2	2-4	0-1
HjB:								
Hand-----	0-7	20-27	13-22	5.6-7.8	0	0	0-2	0
	7-18	20-27	9-20	6.1-7.8	0-2	0	0-2	0
	18-35	18-30	10-15	7.4-8.4	5-20	0-1	0-4	0-1
	35-80	18-30	10-15	7.4-8.4	5-15	0-2	2-4	0-1
Talmo-----	0-7	18-25	10-25	6.6-7.8	0-10	0	0-2	0
	7-80	0-10	2-5	7.4-8.4	5-15	0	0-2	0
HjC:								
Hand-----	0-7	20-27	13-22	5.6-7.8	0	0	0-2	0
	7-18	20-27	9-20	6.1-7.8	0-2	0	0-2	0
	18-35	18-30	10-15	7.4-8.4	5-20	0-1	0-4	0-1
	35-80	18-30	10-15	7.4-8.4	5-15	0-2	2-4	0-1
Talmo-----	0-7	18-25	10-25	6.6-7.8	0-10	0	0-2	0
	7-80	0-10	2-5	7.4-8.4	5-15	0	0-2	0
Hk:								
Harmony-----	0-8	20-26	25-30	6.1-7.3	0	0	0-2	0
	8-34	35-50	20-30	6.6-8.4	0-5	0	0-2	0
	34-50	10-30	15-25	6.6-8.4	5-30	0-3	2-4	0-1
	50-80	25-30	10-20	7.4-9.0	0-5	0-3	0-8	0-1
Aberdeen-----	0-11	20-26	25-28	5.6-7.3	0	0	0-2	0
	11-23	35-55	30-35	6.6-8.4	0-10	0	0-4	0-10
	23-36	30-55	25-35	7.4-9.0	10-20	0-5	2-8	5-15
	36-49	10-30	15-35	7.4-9.0	5-15	0-5	2-8	5-15
	49-80	25-30	10-20	7.4-9.0	5-15	0-5	2-8	5-15

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
Hm:								
Harmony-----	0-11	27-34	30-35	6.1-7.3	0	0	0-2	0
	11-25	35-50	20-30	6.6-8.4	0-5	0	0-2	0
	25-80	10-30	15-25	6.6-9.0	5-30	0-3	2-4	0-1
Aberdeen-----	0-13	27-33	25-30	5.6-7.3	0	0	0-2	0
	13-23	35-55	30-35	6.6-8.4	0-10	0	0-4	0-10
	23-39	30-55	25-35	7.4-9.0	10-20	0-10	2-8	5-15
	39-80	10-26	15-35	7.4-9.0	5-15	0-5	2-8	5-15
Hn:								
Harmony-----	0-11	20-26	25-30	6.1-7.3	0	0	0-2	0
	11-25	35-50	20-30	6.6-8.4	0-5	0	0-2	0
	25-80	10-30	15-25	6.6-9.0	5-30	0-3	2-4	0-1
Beotia-----	0-9	20-27	17-30	6.1-7.8	0	0	0-2	0
	9-21	18-30	10-14	6.1-7.8	0-3	0	0-2	0
	21-39	18-30	10-14	7.4-8.4	5-35	0-2	0-4	0-2
	39-80	18-35	10-14	7.4-8.4	1-25	0-2	0-8	0-4
Ho:								
Harmony-----	0-8	20-26	25-30	6.1-7.3	0	0	0-2	0
	8-34	35-50	20-30	6.6-8.4	0-5	0	0-2	0
	34-50	10-30	15-25	6.6-8.4	5-30	0-3	2-4	0-1
	50-80	25-30	10-20	7.4-9.0	0-5	0-3	0-8	0-1
Beotia-----	0-12	20-27	17-30	6.1-7.8	0	0	0-2	0
	12-27	18-30	14-22	6.1-7.8	0-3	0	0-2	0
	27-46	18-30	11-20	7.4-8.4	5-35	0-2	0-4	0-2
	46-52	18-35	9-15	7.4-8.4	1-25	0-2	0-8	0-4
	52-80	25-30	9-15	7.4-9.0	1-25	0-2	0-8	0-4
Hp:								
Harriet-----	0-2	12-25	13-23	6.6-8.4	0	0	0-2	0
	2-17	35-50	17-26	7.4-9.0	1-45	0-5	4-16	13-25
	17-42	18-40	12-17	7.9-9.0	10-45	0-5	4-16	5-20
	42-80	18-45	13-19	7.9-9.0	10-45	0-5	4-16	2-10
Hr:								
Heil-----	0-2	18-27	15-30	5.6-7.3	0	0	0-2	0
	2-24	45-60	20-35	6.1-9.0	0-5	0-1	4-16	5-20
	24-80	27-50	10-20	7.4-9.0	3-20	0-5	4-16	10-20
HsA:								
Henkin-----	0-7	10-20	8-15	5.6-7.3	0	0	0-2	0
	7-35	7-18	7-14	5.6-7.8	0-2	0	0-2	0
	35-46	7-18	5-10	7.4-8.4	5-10	0	0-2	0
	46-80	3-27	6-10	6.1-8.4	5-10	0	0-2	0
Blendon-----	0-9	10-18	10-20	5.6-7.3	0	0	0-2	0
	9-36	10-20	10-20	6.1-7.3	0	0	0-2	0
	36-48	10-15	5-10	6.1-8.4	0-5	0	0-2	0
	48-80	5-18	5-10	6.6-8.4	0-5	0	0-2	0
HsB:								
Henkin-----	0-7	10-20	8-15	5.6-7.3	0	0	0-2	0
	7-35	7-18	7-14	5.6-7.8	0-2	0	0-2	0
	35-46	7-18	5-10	7.4-8.4	5-10	0	0-2	0
	46-80	3-27	6-10	6.1-8.4	5-10	0	0-2	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
HsB: (cont.)								
Blendon-----	0-9	10-18	10-20	5.6-7.3	0	0	0-2	0
	9-36	10-20	10-20	6.1-7.3	0	0	0-2	0
	36-48	10-15	5-10	6.1-8.4	0-5	0	0-2	0
	48-80	5-18	5-10	6.6-8.4	0-5	0	0-2	0
HtB:								
Houdek-----	0-6	15-26	12-20	6.1-7.3	0	0	0-2	0
	6-19	27-35	12-19	6.6-7.8	0-15	0	0-2	0
	19-42	25-35	12-18	7.4-8.4	5-30	0	0-2	0
	42-80	20-30	10-15	7.4-8.4	1-15	1-5	0-4	0
Ethan-----	0-8	20-27	12-20	6.6-8.4	5-15	0	0-2	0
	8-20	18-30	10-15	7.4-8.4	15-35	0	0-2	0
	20-32	18-30	10-15	7.4-8.4	10-25	0-2	2-4	0-2
	32-60	18-30	10-15	7.4-9.0	10-25	0-5	2-4	0-2
Prosper-----	0-8	18-26	20-30	5.6-7.8	0	0	0	0
	8-30	27-35	24-35	6.6-7.8	0	0	0	0
	30-39	20-30	20-30	7.4-8.4	3-15	0	2-4	0
	39-80	20-30	15-25	7.4-8.4	5-15	0-1	2-4	0
HtC:								
Houdek-----	0-6	15-26	12-20	6.1-7.3	0	0	0-2	0
	6-19	27-35	12-19	6.6-7.8	0-15	0	0-2	0
	19-42	25-35	12-18	7.4-8.4	5-30	0	0-2	0
	42-80	20-30	10-15	7.4-8.4	1-15	1-5	0-4	0
Ethan-----	0-8	20-27	12-20	6.6-8.4	5-15	0	0-2	0
	8-20	18-30	10-15	7.4-8.4	15-35	0	0-2	0
	20-32	18-30	10-15	7.4-8.4	10-25	0-2	2-4	0-2
	32-60	18-30	10-15	7.4-9.0	10-25	0-5	2-4	0-2
Prosper-----	0-8	18-26	20-30	5.6-7.8	0	0	0	0
	8-30	27-35	24-35	6.6-7.8	0	0	0	0
	30-39	20-30	20-30	7.4-8.4	3-15	0	2-4	0
	39-80	20-30	15-25	7.4-8.4	5-15	0-1	2-4	0
HuA:								
Houdek-----	0-6	15-26	12-20	6.1-7.3	0	0	0-2	0
	6-19	27-35	12-19	6.6-7.8	0-15	0	0-2	0
	19-42	25-35	12-18	7.4-8.4	5-30	0	0-2	0
	42-80	20-30	10-15	7.4-8.4	1-15	1-5	0-4	0
Prosper-----	0-8	18-26	20-30	5.6-7.8	0	0	0	0
	8-30	27-35	24-35	6.6-7.8	0	0	0	0
	30-39	20-30	20-30	7.4-8.4	3-15	0	2-4	0
	39-80	20-30	15-25	7.4-8.4	5-15	0-1	2-4	0
HuB:								
Houdek-----	0-6	15-26	12-20	6.1-7.3	0	0	0-2	0
	6-19	27-35	12-19	6.6-7.8	0-15	0	0-2	0
	19-42	25-35	12-18	7.4-8.4	5-30	0	0-2	0
	42-80	20-30	10-15	7.4-8.4	1-15	1-5	0-4	0
Prosper-----	0-8	18-26	20-30	5.6-7.8	0	0	0	0
	8-30	27-35	24-35	6.6-7.8	0	0	0	0
	30-39	20-30	20-30	7.4-8.4	3-15	0	2-4	0
	39-80	20-30	15-25	7.4-8.4	5-15	0-1	2-4	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
HwA:								
Houdek -----	0-6	15-26	12-20	6.1-7.3	0	0	0-2	0
	6-19	27-35	12-19	6.6-7.8	0-15	0	0-2	0
	19-42	25-35	12-18	7.4-8.4	5-30	0	0-2	0
	42-80	20-30	10-15	7.4-8.4	1-15	1-5	0-4	0
Stickney -----	0-10	20-27	20-25	5.6-7.8	0	0	0-2	0
	10-22	35-45	25-30	6.1-7.8	0	0	4-8	5-15
	22-80	20-35	15-25	7.4-9.0	5-20	1-5	4-16	5-15
HxA:								
Houdek -----	0-6	15-26	12-20	6.1-7.3	0	0	0-2	0
	6-19	27-35	12-19	6.6-7.8	0-15	0	0-2	0
	19-42	25-35	12-18	7.4-8.4	5-30	0	0-2	0
	42-80	20-30	10-15	7.4-8.4	1-15	1-5	0-4	0
Stickney -----	0-10	20-27	20-25	5.6-7.8	0	0	0-2	0
	10-22	35-45	25-30	6.1-7.8	0	0	4-8	5-15
	22-80	20-35	15-25	7.4-9.0	5-20	1-5	4-16	5-15
Tetonka -----	0-13	20-27	17-30	5.6-7.3	0	0	0-2	0
	13-39	35-60	21-35	6.1-7.8	0-5	0	0-2	0
	39-80	30-50	16-26	6.6-8.4	0-15	0-2	2-8	0-1
Hy:								
Hoven -----	0-3	22-26	14-22	5.6-7.3	0-1	0-1	0-2	0-2
	3-6	35-60	23-37	6.1-7.8	0-3	1-10	4-16	5-20
	6-22	35-60	23-37	6.6-8.4	3-15	1-10	4-16	5-20
	22-80	35-60	19-32	7.4-9.0	3-20	1-10	4-16	5-20
Ie:								
Ipage -----	0-6	1-5	2-6	5.1-7.3	0	0	0	0
	6-61	1-8	2-8	5.1-7.3	0	0	0	0
	61-80	20-30	10-20	7.4-8.4	5-15	0	0-2	0
Els -----	0-7	2-8	0-5	5.6-7.3	0	0	0	0
	7-49	0-8	0-5	6.1-7.3	0	0	0	0
	49-80	20-30	10-20	7.4-8.4	5-15	0	0-2	0
Shue -----	0-8	5-10	5-10	6.6-7.3	0	0	0	0
	8-26	5-10	4-10	6.6-7.3	0-3	0	0	0
	26-80	20-30	10-15	7.4-8.4	3-25	0	0-4	0
Jh:								
Jerauld -----	0-2	15-25	20-30	5.6-7.3	0	0	0-4	0-5
	2-14	35-60	20-40	6.6-8.4	0-5	0-5	2-8	10-25
	14-33	35-60	20-35	7.9-9.0	0-5	1-5	4-16	5-20
	33-80	27-45	20-35	7.4-9.0	5-20	1-5	4-16	5-20
Hoven -----	0-3	22-26	14-22	5.6-7.3	0-1	0-1	0-2	0-2
	3-6	35-60	23-37	6.1-7.8	0-3	1-10	4-16	5-20
	6-22	35-60	23-37	6.6-8.4	3-15	1-10	4-16	5-20
	22-80	35-60	19-32	7.4-9.0	3-20	1-10	4-16	5-20
KaA:								
Kranzburg -----	0-7	24-26	18-31	5.6-7.3	0	0	0-2	0
	7-14	24-34	13-25	6.6-7.8	0-5	0	0-2	0
	14-26	24-34	14-25	6.6-8.4	0-10	0	0-2	0
	26-48	25-30	12-21	7.4-8.4	10-25	0-2	0-4	0-2
	48-80	25-30	12-21	7.4-9.0	10-30	0-2	0-8	0-2

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	<i>In</i>	<i>Pct</i>	<i>meq/100 g</i>	<i>pH</i>	<i>Pct</i>	<i>Pct</i>	<i>mmhos/cm</i>	
KaA: (cont.)								
Brookings-----	0-15	20-27	25-30	5.6-7.3	0	0	0-2	0
	15-26	25-35	25-30	6.6-8.4	0	0	0-2	0
	26-35	25-35	20-30	7.4-8.4	0-25	0	0-4	0
	35-80	20-35	15-25	7.4-8.4	10-20	0-2	0-8	0-2
KbB:								
Kranzburg-----	0-7	24-26	18-31	5.6-7.3	0	0	0-2	0
	7-14	24-34	13-25	6.6-7.8	0-5	0	0-2	0
	14-26	24-34	14-25	6.6-8.4	0-10	0	0-2	0
	26-48	25-30	12-21	7.4-8.4	10-25	0-2	0-4	0-2
	48-80	25-30	12-21	7.4-9.0	10-30	0-2	0-8	0-2
Brookings-----	0-15	20-27	25-30	5.6-7.3	0	0	0-2	0
	15-26	25-35	25-30	6.6-8.4	0	0	0-2	0
	26-35	25-35	20-30	7.4-8.4	0-25	0	0-4	0
	35-80	20-35	15-25	7.4-8.4	10-20	0-2	0-8	0-2
Buse-----	0-7	18-27	11-19	7.4-8.4	1-25	0	0-2	0
	7-35	18-35	10-20	7.4-8.4	15-40	0	0-4	0
	35-80	18-35	9-18	7.4-8.4	10-20	0	0-4	0
KcA:								
Kranzburg-----	0-7	24-26	18-31	5.6-7.3	0	0	0-2	0
	7-14	24-34	13-25	6.6-7.8	0-5	0	0-2	0
	14-26	24-34	14-25	6.6-8.4	0-10	0	0-2	0
	26-48	25-30	12-21	7.4-8.4	10-25	0-2	0-4	0-2
	48-80	25-30	12-21	7.4-9.0	10-30	0-2	0-8	0-2
Cresbard-----	0-8	20-26	20-25	5.6-7.3	0	0	0-2	0
	8-11	27-40	25-30	5.6-7.3	0	0	2-4	0-5
	11-22	35-50	20-25	6.1-8.4	0-5	0-1	2-4	1-10
	22-38	35-50	15-25	7.4-9.0	10-20	1-5	2-4	5-15
	38-80	25-35	15-20	7.4-9.0	5-20	1-5	2-8	5-15
KtA:								
Kranzburg-----	0-7	24-26	18-31	5.6-7.3	0	0	0-2	0
	7-14	24-34	13-25	6.6-7.8	0-5	0	0-2	0
	14-26	24-34	14-25	6.6-8.4	0-10	0	0-2	0
	26-48	25-30	12-21	7.4-8.4	10-25	0-2	0-4	0-2
	48-80	25-30	12-21	7.4-9.0	10-30	0-2	0-8	0-2
Cresbard-----	0-8	20-26	20-25	5.6-7.3	0	0	0-2	0
	8-11	27-40	25-30	5.6-7.3	0	0	2-4	0-5
	11-22	35-50	20-25	6.1-8.4	0-5	0-1	2-4	1-10
	22-38	35-50	15-25	7.4-9.0	10-20	1-5	2-4	5-15
	38-80	25-35	15-20	7.4-9.0	5-20	1-5	2-8	5-15
Tonka-----	0-16	18-27	15-35	5.6-7.8	0	0	0	0
	16-41	35-50	15-35	5.6-7.8	0-1	0-1	0-2	0-1
	41-80	27-39	10-25	6.6-8.4	5-20	0-2	0-4	0-2
KzB:								
Kranzburg-----	0-7	24-26	18-31	5.6-7.3	0	0	0-2	0
	7-14	24-34	13-25	6.6-7.8	0-5	0	0-2	0
	14-26	24-34	14-25	6.6-8.4	0-10	0	0-2	0
	26-48	25-30	12-21	7.4-8.4	10-25	0-2	0-4	0-2
	48-80	25-30	12-21	7.4-9.0	10-30	0-2	0-8	0-2

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
KzB: (cont.)								
Zell-----	0-7	10-18	15-25	6.6-8.4	0-5	0	0-2	0
	7-31	10-18	10-20	7.4-8.4	15-30	0	0-2	0
	31-80	5-18	10-20	7.4-9.0	10-25	0-1	0-4	0-3
Aastad-----	0-14	24-27	18-28	6.1-7.8	0	0	0	0
	14-29	28-35	15-31	6.6-7.8	0-1	0	0-2	0
	29-80	24-35	10-25	7.4-8.4	5-30	0-1	0-4	0
La:								
La Prairie-----	0-13	18-27	20-35	6.6-8.4	0-3	0-1	0-2	0
	13-33	18-35	20-35	6.6-8.4	0-10	0-1	0-2	0
	33-44	18-35	20-25	6.6-8.4	10-30	0-1	0-2	0
	44-80	18-30	20-25	6.6-8.4	10-30	0-1	0-2	0
Lc:								
La Prairie, channeled-----	0-13	18-27	20-35	6.6-8.4	0-3	0-1	0-2	0
	13-33	18-35	20-35	6.6-8.4	0-10	0-1	0-2	0
	33-44	18-35	20-25	6.6-8.4	10-30	0-1	0-2	0
	44-80	18-30	20-25	6.6-8.4	10-30	0-1	0-2	0
Holmquist, channeled-----	0-7	18-27	20-30	7.4-8.4	5-10	0	2-4	0-5
	7-80	10-35	15-25	7.4-9.0	5-20	0-3	4-8	5-10
Ld:								
LaDelle-----	0-19	20-27	20-28	6.6-7.8	0-10	0	0	0
	19-48	25-35	20-30	7.4-8.4	4-15	0	0-4	0
	48-80	25-35	15-25	7.4-8.4	4-15	0	0-4	0
Le:								
LaDelle, channeled---	0-19	20-27	20-28	6.6-7.8	0-10	0	0	0
	19-48	25-35	20-30	7.4-8.4	4-15	0	0-4	0
	48-80	25-35	15-25	7.4-8.4	4-15	0	0-4	0
Lk:								
Lamo-----	0-22	18-35	18-28	7.4-8.4	1-10	0	0-2	0
	22-80	25-35	15-25	7.4-8.4	1-15	0	0-4	0
Lm:								
Lamoure-----	0-19	27-34	25-32	7.4-8.4	0-10	0	0-4	1-2
	19-38	25-34	24-31	7.4-8.4	9-20	0	0-4	1-3
	38-55	25-34	20-29	7.4-8.4	9-20	0-1	0-4	1-3
	55-80	20-34	16-23	7.4-8.4	4-20	0-2	0-4	1-3
Ln:								
Lawet-----	0-8	15-27	15-30	7.4-8.4	5-20	0	0-4	0
	8-51	15-35	15-30	7.4-9.0	10-40	0	0-4	0-6
	51-80	0-15	0-10	6.6-8.4	0-10	0	0-8	0
Lo:								
Lawet, wet-----	0-8	15-27	15-30	7.4-8.4	5-20	0	0-4	0
	8-51	15-35	15-30	7.4-9.0	10-40	0	0-4	0-6
	51-80	0-15	0-10	6.6-8.4	0-10	0	0-8	0
Lp:								
Lawet-----	0-8	15-27	15-30	7.4-8.4	5-20	0	0-4	0
	8-51	15-35	15-30	7.4-9.0	10-40	0	0-4	0-6
	51-80	0-15	0-10	6.6-8.4	0-10	0	0-8	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
Lp: (cont.)								
Davison-----	0-8	18-26	13-21	6.6-8.4	5-15	0	0-2	0
	8-28	18-30	10-15	7.4-9.0	15-30	0-5	0-2	0-1
	28-53	18-30	10-15	7.4-8.4	10-20	0-5	2-4	0-2
	53-80	15-30	9-14	7.4-8.4	5-15	0-2	2-8	0-2
LrA:								
Lehr-----	0-7	10-27	15-30	6.6-7.8	0	0	0	0
	7-19	18-30	10-30	6.6-8.4	0-15	0	0	0
	19-80	0-10	0-5	7.4-8.4	0-10	0	0	0
Bowdle-----	0-10	18-27	15-25	6.1-7.3	0	0	0-2	0
	10-24	18-30	10-20	6.1-7.3	0-3	0	0-2	0
	24-29	18-25	10-15	7.4-8.4	3-15	0	0-2	0
	29-80	2-7	2-4	7.4-8.4	3-15	0	0-2	0
LrB:								
Lehr-----	0-7	10-27	15-30	6.6-7.8	0	0	0	0
	7-19	18-30	10-30	6.6-8.4	0-15	0	0	0
	19-80	0-10	0-5	7.4-8.4	0-10	0	0	0
Bowdle-----	0-10	18-27	15-25	6.1-7.3	0	0	0-2	0
	10-24	18-30	10-20	6.1-7.3	0-3	0	0-2	0
	24-29	18-25	10-15	7.4-8.4	3-15	0	0-2	0
	29-80	2-7	2-4	7.4-8.4	3-15	0	0-2	0
Ls:								
Lowe-----	0-7	24-27	25-30	6.6-8.4	0-10	0	0-2	0-2
	7-34	24-35	20-30	7.4-8.4	15-35	0-3	0-2	0-2
	34-80	10-30	15-25	7.4-8.4	5-20	0-3	0-4	0-2
Lt:								
Ludden-----	0-14	40-60	25-50	6.1-8.4	0-10	0	0-4	0
	14-41	40-60	20-30	7.9-8.4	5-20	0-2	0-4	0-2
	41-80	35-60	20-30	7.9-8.4	5-20	0-2	0-8	0-2
Lu:								
Ludden, ponded-----	0-14	40-60	25-50	6.1-8.4	0-10	0	0-4	0
	14-41	40-60	20-30	7.9-8.4	5-20	0-2	0-4	0-2
	41-80	35-60	20-30	7.9-8.4	5-20	0-2	0-8	0-2
Lw:								
Ludden, wet-----	0-14	40-60	25-50	6.1-8.4	0-10	0	0-4	0
	14-41	40-60	20-30	7.9-8.4	5-20	0-2	0-4	0-2
	41-80	35-60	20-30	7.9-8.4	5-20	0-2	0-8	0-2
M-W:								
Miscellaneous water--	---	---	---	---	---	---	---	---
MaC:								
Maddock-----	0-9	5-15	5-15	6.6-7.8	0-3	0	0	0
	9-80	3-9	2-7	6.6-8.4	0-10	0	0	0
Egeland-----	0-8	10-18	15-20	5.6-7.3	0	0	0-2	0
	8-31	10-18	15-20	6.1-7.8	0	0	0-2	0
	31-64	5-10	5-15	6.6-8.4	5-20	0	0-2	0
	64-80	6-14	15-20	7.4-8.4	5-20	0	0-2	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
MdA:								
Max-----	0-14	18-27	15-26	6.6-7.8	0	0	0-2	0
	14-80	18-35	11-16	7.4-8.4	10-30	0	0-4	0
Arnegard-----	0-8	15-25	15-25	6.1-7.8	0	0	0-2	0
	8-25	18-30	10-15	6.1-7.8	0-5	0	0-2	0-1
	25-80	5-30	5-15	6.6-8.4	1-20	0	0-4	0-2
MdB:								
Max-----	0-14	18-27	15-26	6.6-7.8	0	0	0-2	0
	14-80	18-35	11-16	7.4-8.4	10-30	0	0-4	0
Arnegard-----	0-8	15-25	15-25	6.1-7.8	0	0	0-2	0
	8-25	18-30	10-15	6.1-7.8	0-5	0	0-2	0-1
	25-80	5-30	5-15	6.6-8.4	1-20	0	0-4	0-2
MgB:								
Max-----	0-14	18-27	15-26	6.6-7.8	0	0	0-2	0
	14-80	18-35	11-16	7.4-8.4	10-30	0	0-4	0
Arnegard-----	0-8	15-25	15-25	6.1-7.8	0	0	0-2	0
	8-25	18-30	10-15	6.1-7.8	0-5	0	0-2	0-1
	25-80	5-30	5-15	6.6-8.4	1-20	0	0-4	0-2
Zahl-----	0-8	18-27	10-20	6.6-8.4	1-10	0	0-2	0
	8-29	20-30	10-15	7.4-8.4	15-25	0-2	0-4	0
	29-80	20-30	10-15	7.4-8.4	5-25	0-2	0-4	0
MnB:								
Max-----	0-14	18-27	15-26	6.6-7.8	0	0	0-2	0
	14-80	18-35	11-16	7.4-8.4	10-30	0	0-4	0
Niobell-----	0-12	10-27	10-25	5.6-7.3	0	0	0	0
	12-28	25-45	10-20	6.1-8.4	0-5	0-2	0-4	5-15
	28-80	18-30	10-15	7.9-9.0	10-20	0-3	2-8	5-10
Noonan-----	0-8	15-27	10-25	5.6-7.3	0	0	0	0
	8-18	35-45	10-20	6.6-9.0	0-3	0-2	0-4	5-15
	18-80	20-30	10-15	7.4-9.0	10-30	0-3	2-8	5-10
MxC:								
Max-----	0-14	18-27	15-26	6.6-7.8	0	0	0-2	0
	14-80	18-35	11-16	7.4-8.4	10-30	0	0-4	0
Zahl-----	0-8	18-27	10-20	6.6-8.4	1-10	0	0-2	0
	8-29	20-30	10-15	7.4-8.4	15-25	0-2	0-4	0
	29-80	20-30	10-15	7.4-8.4	5-25	0-2	0-4	0
Arnegard-----	0-8	15-25	15-25	6.1-7.8	0	0	0-2	0
	8-25	18-30	10-15	6.1-7.8	0-5	0	0-2	0-1
	25-80	5-30	5-15	6.6-8.4	1-20	0	0-4	0-2
My:								
Miranda-----	0-3	18-26	10-25	6.1-7.3	0	0	0-2	0-5
	3-13	35-45	10-20	6.6-9.0	0-10	0-5	2-8	13-20
	13-80	20-30	10-15	7.9-9.0	5-30	1-10	4-16	13-20
Heil-----	0-2	18-27	15-30	5.6-7.3	0	0	0-2	0
	2-24	45-60	20-35	6.1-9.0	0-5	0-1	4-16	5-20
	24-80	27-50	10-20	7.4-9.0	3-20	0-5	4-16	10-20

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
Mz:								
Moritz-----	0-12	20-27	25-30	6.6-8.4	0-10	0-2	0-2	0
	12-44	20-35	20-30	7.4-9.0	5-35	0-3	0-2	0-2
	44-80	10-27	15-25	7.4-9.0	5-20	0-3	0-4	0-2
Lowe-----	0-7	24-27	25-30	6.6-8.4	0-10	0	0-2	0-2
	7-34	24-35	20-30	7.4-8.4	15-35	0-3	0-2	0-2
	34-80	10-30	15-25	7.4-8.4	5-20	0-3	0-4	0-2
Na:								
Nahon-----	0-7	23-26	20-30	5.6-7.3	0	0	0-2	0-3
	7-9	20-30	20-30	5.6-7.3	0	0	0-2	0-3
	9-21	35-55	30-40	6.6-9.0	0	0	0-2	0-10
	21-43	23-55	25-35	7.4-9.0	10-20	0-5	4-16	5-15
	43-49	30-60	20-35	7.9-9.0	10-20	0-5	4-16	5-20
	49-80	25-30	10-20	7.4-9.0	5-15	0-5	2-8	5-15
Aberdeen-----	0-13	20-33	25-30	5.6-7.3	0	0	0-2	0
	13-23	35-55	30-35	6.6-8.4	0-10	0	0-4	0-10
	23-39	30-55	25-35	7.4-9.0	10-20	0-10	2-8	5-15
	39-80	10-26	15-35	7.4-9.0	5-15	0-5	2-8	5-15
Exline-----	0-2	20-26	11-20	6.1-7.8	0	0	0-2	0
	2-21	35-55	18-27	6.6-9.0	0-15	0-2	4-16	5-20
	21-40	35-50	17-26	7.9-9.0	3-20	0-10	4-8	5-20
	40-80	25-35	12-18	7.9-9.0	3-20	0-5	2-8	5-15
Nb:								
Nahon-----	0-7	23-26	20-30	5.6-7.3	0	0	0-2	0-3
	7-9	20-30	20-30	5.6-7.3	0	0	0-2	0-3
	9-21	35-55	30-40	6.6-9.0	0	0	0-2	0-10
	21-43	23-55	25-35	7.4-9.0	10-20	0-5	4-16	5-15
	43-49	30-60	20-35	7.9-9.0	10-20	0-5	4-16	5-20
	49-80	25-30	10-20	7.4-9.0	5-15	0-5	2-8	5-15
Aberdeen-----	0-11	20-26	25-28	5.6-7.3	0	0	0-2	0
	11-23	35-55	30-35	6.6-8.4	0-10	0	0-4	0-10
	23-36	30-55	25-35	7.4-9.0	10-20	0-5	2-8	5-15
	36-49	10-30	15-35	7.4-9.0	5-15	0-5	2-8	5-15
	49-80	25-30	10-20	7.4-9.0	5-15	0-5	2-8	5-15
Exline-----	0-2	20-26	11-20	6.1-7.8	0	0	0-2	0
	2-24	35-55	18-27	6.6-9.0	0-15	0-2	4-16	5-20
	24-39	35-50	17-26	7.9-9.0	3-20	0-10	4-8	5-20
	39-55	25-35	12-18	7.9-9.0	3-20	0-5	2-8	5-15
	55-80	25-30	10-20	7.4-9.0	5-15	0-5	2-8	5-15
Nc:								
Niobell-----	0-12	10-27	10-25	5.6-7.3	0	0	0	0
	12-28	25-45	10-20	6.1-8.4	0-5	0-2	0-4	5-15
	28-80	18-30	10-15	7.9-9.0	10-20	0-3	2-8	5-10
Noonan-----	0-8	15-27	10-25	5.6-7.3	0	0	0	0
	8-18	35-45	10-20	6.6-9.0	0-3	0-2	0-4	5-15
	18-80	20-30	10-15	7.4-9.0	10-30	0-3	2-8	5-10
Nd:								
Niobell-----	0-12	10-27	10-25	5.6-7.3	0	0	0	0
	12-28	25-45	10-20	6.1-8.4	0-5	0-2	0-4	5-15
	28-80	18-30	10-15	7.9-9.0	10-20	0-3	2-8	5-10

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
Nd: (cont.)								
Noonan-----	0-8	15-27	10-25	5.6-7.3	0	0	0	0
	8-18	35-45	10-20	6.6-9.0	0-3	0-2	0-4	5-15
	18-80	20-30	10-15	7.4-9.0	10-30	0-3	2-8	5-10
Heil-----	0-2	18-27	15-30	5.6-7.3	0	0	0-2	0
	2-24	45-60	20-35	6.1-9.0	0-5	0-1	4-16	5-20
	24-80	27-50	10-20	7.4-9.0	3-20	0-5	4-16	10-20
NeA:								
Niobell-----	0-12	10-27	10-25	5.6-7.3	0	0	0	0
	12-28	25-45	10-20	6.1-8.4	0-5	0-2	0-4	5-15
	28-80	18-30	10-15	7.9-9.0	10-20	0-3	2-8	5-10
Noonan-----	0-8	15-27	10-25	5.6-7.3	0	0	0	0
	8-18	35-45	10-20	6.6-9.0	0-3	0-2	0-4	5-15
	18-80	20-30	10-15	7.4-9.0	10-30	0-3	2-8	5-10
Max-----	0-14	18-27	15-26	6.6-7.8	0	0	0-2	0
	14-80	18-35	11-16	7.4-8.4	10-30	0	0-4	0
Nm:								
Noonan-----	0-8	15-27	10-25	5.6-7.3	0	0	0	0
	8-18	35-45	10-20	6.6-9.0	0-3	0-2	0-4	5-15
	18-80	20-30	10-15	7.4-9.0	10-30	0-3	2-8	5-10
Miranda-----	0-3	18-26	10-25	6.1-7.3	0	0	0-2	0-5
	3-13	35-45	10-20	6.6-9.0	0-10	0-5	2-8	13-20
	13-80	20-30	10-15	7.9-9.0	5-30	1-10	4-16	13-20
Nr:								
Northville-----	0-5	20-27	20-35	6.1-7.8	0	0	0-2	0
	5-8	25-35	25-30	6.1-7.8	0	0	0-2	0-3
	8-22	35-50	25-30	6.6-8.4	0-5	0-2	0-4	5-15
	22-58	20-50	25-30	7.4-9.0	10-20	1-5	4-16	5-15
	58-80	28-50	20-25	7.4-9.0	10-20	1-5	4-16	5-10
Farmsworth-----	0-8	20-27	15-20	5.6-7.3	0	0	0-2	0-5
	8-25	35-60	20-30	6.1-8.4	0-5	0-1	4-16	5-20
	25-43	35-55	20-30	7.4-9.0	1-30	1-10	4-16	2-20
	43-80	25-35	10-20	7.4-9.0	3-15	1-10	4-16	2-15
Nv:								
Northville-----	0-5	20-27	20-35	6.1-7.8	0	0	0-2	0
	5-8	25-35	25-30	6.1-7.8	0	0	0-2	0-3
	8-22	35-50	25-30	6.6-8.4	0-5	0-2	0-4	5-15
	22-58	20-50	25-30	7.4-9.0	10-20	1-5	4-16	5-15
	58-80	28-50	20-25	7.4-9.0	10-20	1-5	4-16	5-10
Farmsworth-----	0-8	20-27	15-20	5.6-7.3	0	0	0-2	0-5
	8-25	35-60	20-30	6.1-8.4	0-5	0-1	4-16	5-20
	25-43	35-55	20-30	7.4-9.0	1-30	1-10	4-16	2-20
	43-80	25-35	10-20	7.4-9.0	3-15	1-10	4-16	2-15
Hoven-----	0-3	22-26	14-22	5.6-7.3	0-1	0-1	0-2	0-2
	3-6	35-60	23-37	6.1-7.8	0-3	1-10	4-16	5-20
	6-22	35-60	23-37	6.6-8.4	3-15	1-10	4-16	5-20
	22-80	35-60	19-32	7.4-9.0	3-20	1-10	4-16	5-20

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
Ov:								
Overshue-----	0-7	10-18	10-25	6.1-7.8	0	0	0	0
	7-42	5-18	5-15	6.6-7.8	0-5	0	0	0-1
	42-80	20-30	10-15	7.4-8.4	5-20	0-2	0-4	0-1
Pa:								
Parnell-----	0-11	27-40	25-40	6.1-7.8	0	0	0-2	0
	11-41	35-60	19-29	6.1-7.8	0-3	0-2	0-2	0-1
	41-80	35-45	16-24	6.6-8.4	0-10	0-2	0-2	0-1
Pc:								
Parshall-----	0-11	10-20	10-15	5.6-8.4	0-3	0	0	0
	11-36	5-20	5-13	6.6-8.4	0-3	0	0	0
	36-80	5-20	5-10	7.4-8.4	0-10	0	0-2	0
PeA:								
Peever-----	0-7	27-35	25-30	6.1-7.3	0	0	0-2	0
	7-15	35-50	25-30	6.6-7.8	0-10	0-5	0-2	0-5
	15-38	30-45	20-25	7.4-8.4	10-20	0-10	0-4	0-10
	38-80	30-45	15-25	7.4-8.4	10-15	0-10	0-8	0-10
PgB:								
Peever-----	0-7	27-35	25-30	6.1-7.3	0	0	0-2	0
	7-15	35-50	25-30	6.6-7.8	0-10	0-5	0-2	0-5
	15-38	30-45	20-25	7.4-8.4	10-20	0-10	0-4	0-10
	38-80	30-45	15-25	7.4-8.4	10-15	0-10	0-8	0-10
Buse-----	0-7	27-35	15-24	6.6-8.4	1-25	0	0-2	0
	7-35	18-35	10-20	7.4-8.4	15-40	0	0-2	0
	35-80	18-35	9-18	7.4-8.4	10-20	0	0-4	0
PoA:								
Peever-----	0-7	27-35	25-30	6.1-7.3	0	0	0-2	0
	7-15	35-50	25-30	6.6-7.8	0-10	0-5	0-2	0-5
	15-38	30-45	20-25	7.4-8.4	10-20	0-10	0-4	0-10
	38-80	30-45	15-25	7.4-8.4	10-15	0-10	0-8	0-10
Cavour-----	0-9	18-25	20-28	6.1-7.8	0	0	0-2	0-3
	9-22	35-50	30-39	6.6-9.0	0-15	0-3	4-16	2-10
	22-45	25-50	20-32	7.4-9.0	8-25	1-3	8-16	16-21
	45-80	25-35	17-25	7.4-9.0	5-15	1-5	8-16	8-16
Pp:								
Pits, gravel and sand	0-10	10-20	10-20	6.1-7.8	5-20	0	0-2	0
	10-80	0-5	5-15	7.4-8.4	5-20	0	0-2	0
Pr:								
Playmoor-----	0-9	27-34	25-32	7.4-9.0	1-8	0	4-16	2-7
	9-27	20-34	25-32	7.4-9.0	10-20	1-3	4-16	2-5
	27-46	20-34	25-32	7.4-9.0	10-20	1-3	4-16	2-5
	46-80	20-34	25-32	7.4-9.0	10-20	1-3	4-16	2-5
Py:								
Playmoor, channeled--	0-9	27-34	25-32	7.4-9.0	1-8	0	4-16	2-7
	9-27	20-34	25-32	7.4-9.0	10-20	1-3	4-16	2-5
	27-46	20-34	25-32	7.4-9.0	10-20	1-3	4-16	2-5
	46-80	20-34	25-32	7.4-9.0	10-20	1-3	4-16	2-5

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
Py: (cont.)								
Lamoure, channeled---	0-19	27-34	25-32	7.4-8.4	0-10	0	0-4	1-2
	19-38	25-34	24-31	7.4-8.4	9-20	0	0-4	1-3
	38-55	25-34	20-29	7.4-8.4	9-20	0-1	0-4	1-3
	55-80	20-34	16-23	7.4-8.4	4-20	0-2	0-4	1-3
Ra:								
Ranslo-----	0-9	27-35	15-25	5.6-7.3	0	0	0-2	0
	9-25	35-45	12-18	6.6-8.4	0-15	0	2-4	1-5
	25-37	35-50	16-24	7.4-9.0	10-45	0-5	2-8	2-20
	37-80	27-40	12-18	7.4-9.0	10-45	1-10	2-8	15-30
Re:								
Ranslo-----	0-9	15-26	13-21	5.6-7.3	0	0	0-2	0
	9-25	35-45	12-18	6.6-8.4	0-15	0	2-4	1-5
	25-37	35-50	16-24	7.4-9.0	10-45	0-5	2-8	2-20
	37-80	27-40	12-18	7.4-9.0	10-45	1-10	2-8	15-30
Harriet-----	0-2	12-25	13-23	6.6-8.4	0	0	0-2	0
	2-17	35-50	17-26	7.4-9.0	1-45	0-5	4-16	13-25
	17-42	18-40	12-17	7.9-9.0	10-45	0-5	4-16	5-20
	42-80	18-45	13-19	7.9-9.0	10-45	0-5	4-16	2-10
RfA:								
Renshaw-----	0-7	20-26	21-25	6.1-7.8	0-1	0	0-2	0
	7-15	18-27	1-10	6.6-8.4	0-15	0	0-2	0
	15-80	0-10	1-10	6.6-8.4	1-15	0	0-2	0
Fordville-----	0-8	18-25	21-27	6.1-7.3	0-1	0	0-2	0
	8-21	18-30	21-27	6.1-7.8	0-5	0	0-2	0
	21-33	15-30	15-25	6.1-8.4	2-25	0	0-2	0
	33-80	0-5	1-10	7.4-8.4	2-20	0	0-2	0
RfB:								
Renshaw-----	0-7	20-26	21-25	6.1-7.8	0-1	0	0-2	0
	7-15	18-27	1-10	6.6-8.4	0-15	0	0-2	0
	15-80	0-10	1-10	6.6-8.4	1-15	0	0-2	0
Fordville-----	0-8	18-25	21-27	6.1-7.3	0-1	0	0-2	0
	8-21	18-30	21-27	6.1-7.8	0-5	0	0-2	0
	21-33	15-30	15-25	6.1-8.4	2-25	0	0-2	0
	33-80	0-5	1-10	7.4-8.4	2-20	0	0-2	0
So:								
Southam-----	0-7	27-40	25-50	6.6-8.4	0-10	0-1	2-8	0-2
	7-51	35-50	25-65	6.6-8.4	3-25	0-1	2-8	0-2
	51-60	18-50	15-45	7.4-8.4	10-30	0-5	2-8	0-2
St:								
Stickney-----	0-10	20-27	20-25	5.6-7.8	0	0	0-2	0
	10-22	35-45	25-30	6.1-7.8	0	0	4-8	5-15
	22-80	20-35	15-25	7.4-9.0	5-20	1-5	4-16	5-15
Dudley-----	0-7	18-25	12-21	5.6-7.3	0	0	0-2	0-5
	7-18	35-50	17-26	6.1-8.4	0-5	0	4-8	10-20
	18-39	30-50	16-24	7.4-9.0	1-20	1-5	8-16	3-10
	39-80	20-35	11-17	7.4-9.0	1-15	1-5	8-16	3-15

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
Su:								
Stickney-----	0-10	20-27	20-25	5.6-7.8	0	0	0-2	0
	10-22	35-45	25-30	6.1-7.8	0	0	4-8	5-15
	22-80	20-35	15-25	7.4-9.0	5-20	1-5	4-16	5-15
Dudley-----	0-7	18-25	12-21	5.6-7.3	0	0	0-2	0-5
	7-18	35-50	17-26	6.1-8.4	0-5	0	4-8	10-20
	18-39	30-50	16-24	7.4-9.0	1-20	1-5	8-16	3-10
	39-80	20-35	11-17	7.4-9.0	1-15	1-5	8-16	3-15
Hoven-----	0-3	22-26	14-22	5.6-7.3	0-1	0-1	0-2	0-2
	3-6	35-60	23-37	6.1-7.8	0-3	1-10	4-16	5-20
	6-22	35-60	23-37	6.6-8.4	3-15	1-10	4-16	5-20
	22-80	35-60	19-32	7.4-9.0	3-20	1-10	4-16	5-20
Sw:								
Straw, channeled----	0-25	10-27	15-20	6.6-8.4	0-5	0	0-2	0
	25-80	10-35	10-15	6.6-8.4	3-15	0	0-2	0
Sx:								
Straw-----	0-25	10-27	15-20	6.6-8.4	0-5	0	0-2	0
	25-80	10-35	10-15	6.6-8.4	3-15	0	0-2	0
TbE:								
Talmo, stony-----	0-7	18-25	10-25	6.6-7.8	0-10	0	0-2	0
	7-80	0-10	2-5	7.4-8.4	5-15	0	0-2	0
Ethan, stony-----	0-8	20-27	12-20	6.6-8.4	5-15	0	0-2	0
	8-20	18-30	10-15	7.4-8.4	15-35	0	0-2	0
	20-32	18-30	10-15	7.4-8.4	10-25	0-2	2-4	0-2
	32-60	18-30	10-15	7.4-9.0	10-25	0-5	2-4	0-2
Te:								
Tetonka-----	0-13	20-27	17-30	5.6-7.3	0	0	0-2	0
	13-39	35-60	21-35	6.1-7.8	0-5	0	0-2	0
	39-80	30-50	16-26	6.6-8.4	0-15	0-2	2-8	0-1
Tk:								
Toko-----	0-8	5-15	7-13	5.6-7.3	0	0	0-2	0
	8-11	5-10	3-6	5.6-7.8	0	0	0-2	0
	11-28	18-35	10-15	6.1-7.8	0-5	0	0-2	0-1
	28-56	5-20	8-16	7.4-9.0	5-20	0-2	0-4	0-1
	56-80	15-30	9-14	7.4-9.0	5-20	0-2	0-4	0-1
Tm:								
Toko, wet-----	0-8	5-15	7-13	5.6-7.3	0	0	0-2	0
	8-11	5-10	3-6	5.6-7.8	0	0	0-2	0
	11-28	18-35	10-15	6.1-7.8	0-5	0	0-2	0-1
	28-56	5-20	8-16	7.4-9.0	5-20	0-2	0-4	0-1
	56-80	15-30	9-14	7.4-9.0	5-20	0-2	0-4	0-1
Tn:								
Tonka-----	0-16	18-27	15-35	5.6-7.8	0	0	0	0
	16-41	35-50	15-35	5.6-7.8	0-1	0-1	0-2	0-1
	41-80	27-39	10-25	6.6-8.4	5-20	0-2	0-4	0-2
To:								
Tonka-----	0-16	18-27	15-35	5.6-7.8	0	0	0	0
	16-41	35-50	15-35	5.6-7.8	0-1	0-1	0-2	0-1
	41-80	27-39	10-25	6.6-8.4	5-20	0-2	0-4	0-2

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
To: (cont.)								
Rimlap-----	0-10	20-27	15-20	6.1-7.3	0	0	0	0
	10-39	35-55	30-35	6.6-8.4	0	0	0	0
	39-45	35-55	30-35	6.6-8.4	1-15	1-3	0-4	0
	45-80	18-35	10-20	7.4-8.4	5-20	0-5	0-4	0-5
Us:								
Udorthents, silty----	0-8	18-26	15-25	6.6-8.4	0-10	0	0-2	0
	8-80	18-35	10-20	7.4-8.4	10-20	0-5	0-4	0-2
Va:								
Vallers-----	0-6	18-27	20-32	7.4-8.4	12-25	0	0-4	0
	6-30	18-35	10-18	7.4-8.4	20-35	0-2	0-4	0
	30-80	18-35	8-16	7.4-8.4	12-25	0-2	0-4	0
Hamerly-----	0-9	18-27	15-30	6.6-8.4	0-10	0	0-2	0
	9-29	18-35	10-20	7.4-8.4	15-35	0-2	0-4	0-2
	29-80	18-35	10-20	7.4-8.4	10-30	0-2	0-4	0-2
VgA:								
Vang-----	0-9	18-27	15-25	5.6-7.3	0	0-1	0	0-1
	9-29	18-30	10-20	5.6-8.4	0-10	0-1	0-2	0-1
	29-80	0-5	5-10	5.6-8.4	5-15	0-1	0-2	0-2
W:								
Water-----	---	---	---	---	---	---	---	---
WaA:								
Williams-----	0-7	10-27	15-30	6.6-7.8	0	0	0	0
	7-22	24-35	10-30	6.6-7.8	0-15	0	0-2	0
	22-80	18-35	10-25	7.4-8.4	5-20	0-2	0-4	0-5
Bowbells-----	0-8	20-26	25-30	6.1-7.3	0	0	0-2	0
	8-28	25-35	25-30	6.1-7.3	0-5	0	0-2	0
	28-80	25-35	20-25	7.4-8.4	10-20	0-1	0-4	0-1
WaB:								
Williams-----	0-7	10-27	15-30	6.6-7.8	0	0	0	0
	7-22	24-35	10-30	6.6-7.8	0-15	0	0-2	0
	22-80	18-35	10-25	7.4-8.4	5-20	0-2	0-4	0-5
Bowbells-----	0-8	20-26	25-30	6.1-7.3	0	0	0-2	0
	8-28	25-35	25-30	6.1-7.3	0-5	0	0-2	0
	28-80	25-35	20-25	7.4-8.4	10-20	0-1	0-4	0-1
WbA:								
Williams-----	0-7	10-27	15-30	6.6-7.8	0	0	0	0
	7-22	24-35	10-30	6.6-7.8	0-15	0	0-2	0
	22-80	18-35	10-25	7.4-8.4	5-20	0-2	0-4	0-5
Bowbells-----	0-8	20-26	25-30	6.1-7.3	0	0	0-2	0
	8-28	25-35	25-30	6.1-7.3	0-5	0	0-2	0
	28-80	25-35	20-25	7.4-8.4	10-20	0-1	0-4	0-1
Tonka-----	0-16	18-27	15-35	5.6-7.8	0	0	0	0
	16-41	35-50	15-35	5.6-7.8	0-1	0-1	0-2	0-1
	41-80	27-39	10-25	6.6-8.4	5-20	0-2	0-4	0-2

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	<i>In</i>	<i>Pct</i>	<i>meq/100 g</i>	<i>pH</i>	<i>Pct</i>	<i>Pct</i>	<i>mmhos/cm</i>	
WbB:								
Williams-----	0-7	10-27	15-30	6.6-7.8	0	0	0	0
	7-22	24-35	10-30	6.6-7.8	0-15	0	0-2	0
	22-80	18-35	10-25	7.4-8.4	5-20	0-2	0-4	0-5
Bowbells-----	0-8	20-26	25-30	6.1-7.3	0	0	0-2	0
	8-28	25-35	25-30	6.1-7.3	0-5	0	0-2	0
	28-80	25-35	20-25	7.4-8.4	10-20	0-1	0-4	0-1
Tonka-----	0-16	18-27	15-35	5.6-7.8	0	0	0	0
	16-41	35-50	15-35	5.6-7.8	0-1	0-1	0-2	0-1
	41-80	27-39	10-25	6.6-8.4	5-20	0-2	0-4	0-2
WcA:								
Williams-----	0-7	10-27	15-30	6.6-7.8	0	0	0	0
	7-22	24-35	10-30	6.6-7.8	0-15	0	0-2	0
	22-80	18-35	10-25	7.4-8.4	5-20	0-2	0-4	0-5
Niobell-----	0-12	10-27	10-25	5.6-7.3	0	0	0	0
	12-28	25-45	10-20	6.1-8.4	0-5	0-2	0-4	5-15
	28-80	18-30	10-15	7.9-9.0	10-20	0-3	2-8	5-10
WcB:								
Williams-----	0-7	10-27	15-30	6.6-7.8	0	0	0	0
	7-22	24-35	10-30	6.6-7.8	0-15	0	0-2	0
	22-80	18-35	10-25	7.4-8.4	5-20	0-2	0-4	0-5
Niobell-----	0-12	10-27	10-25	5.6-7.3	0	0	0	0
	12-28	25-45	10-20	6.1-8.4	0-5	0-2	0-4	5-15
	28-80	18-30	10-15	7.9-9.0	10-20	0-3	2-8	5-10
WdA:								
Williams-----	0-7	10-27	15-30	6.6-7.8	0	0	0	0
	7-22	24-35	10-30	6.6-7.8	0-15	0	0-2	0
	22-80	18-35	10-25	7.4-8.4	5-20	0-2	0-4	0-5
Niobell-----	0-12	10-27	10-25	5.6-7.3	0	0	0	0
	12-28	25-45	10-20	6.1-8.4	0-5	0-2	0-4	5-15
	28-80	18-30	10-15	7.9-9.0	10-20	0-3	2-8	5-10
Tonka-----	0-16	18-27	15-35	5.6-7.8	0	0	0	0
	16-41	35-50	15-35	5.6-7.8	0-1	0-1	0-2	0-1
	41-80	27-39	10-25	6.6-8.4	5-20	0-2	0-4	0-2
WhD:								
Williams-----	0-7	10-27	15-30	6.6-7.8	0	0	0	0
	7-22	24-35	10-30	6.6-7.8	0-15	0	0-2	0
	22-80	18-35	10-25	7.4-8.4	5-20	0-2	0-4	0-5
Vida-----	0-3	15-27	10-15	6.6-8.4	0	0	0	0
	3-9	25-35	15-20	6.6-8.4	0	0	0-2	0
	9-21	25-35	15-20	7.4-8.4	5-15	0	0-2	0
	21-80	25-35	15-20	7.9-9.0	5-15	0	0-2	0
WmB:								
Williams-----	0-7	10-27	15-30	6.6-7.8	0	0	0	0
	7-22	24-35	10-30	6.6-7.8	0-15	0	0-2	0
	22-80	18-35	10-25	7.4-8.4	5-20	0-2	0-4	0-5

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
WmB: (cont.)								
Zahl-----	0-8	18-27	10-20	6.6-8.4	1-10	0	0-2	0
	8-29	20-30	10-15	7.4-8.4	15-25	0-2	0-4	0
	29-80	20-30	10-15	7.4-8.4	5-25	0-2	0-4	0
Bowbells-----	0-8	20-26	25-30	6.1-7.3	0	0	0-2	0
	8-28	25-35	25-30	6.1-7.3	0-5	0	0-2	0
	28-80	25-35	20-25	7.4-8.4	10-20	0-1	0-4	0-1
WmC:								
Williams-----	0-7	10-27	15-30	6.6-7.8	0	0	0	0
	7-22	24-35	10-30	6.6-7.8	0-15	0	0-2	0
	22-80	18-35	10-25	7.4-8.4	5-20	0-2	0-4	0-5
Zahl-----	0-8	18-27	10-20	6.6-8.4	1-10	0	0-2	0
	8-29	20-30	10-15	7.4-8.4	15-25	0-2	0-4	0
	29-80	20-30	10-15	7.4-8.4	5-25	0-2	0-4	0
Bowbells-----	0-8	20-26	25-30	6.1-7.3	0	0	0-2	0
	8-28	25-35	25-30	6.1-7.3	0-5	0	0-2	0
	28-80	25-35	20-25	7.4-8.4	10-20	0-1	0-4	0-1
Wn:								
Winship-----	0-25	18-26	25-30	6.6-7.8	0	0	0-2	0
	25-57	26-34	25-30	6.6-7.8	0-1	0	0-2	0
	57-80	24-30	15-20	6.6-8.4	0-15	0-1	0-2	0-2
Tonka-----	0-16	18-27	15-35	5.6-7.8	0	0	0	0
	16-41	35-50	15-35	5.6-7.8	0-1	0-1	0-2	0-1
	41-80	27-39	10-25	6.6-8.4	5-20	0-2	0-4	0-2
Wo:								
Winship-----	0-18	18-26	25-30	6.6-7.8	0	0	0-2	0
	18-41	26-34	25-30	6.6-7.8	0-1	0	0-2	0
	41-57	24-30	15-20	6.6-8.4	0-10	0-1	0-2	0-2
	57-80	25-30	10-20	7.4-9.0	5-15	0-1	0-4	0-2
Tonka, undrained-----	0-16	18-27	15-35	5.6-7.8	0	0	0	0
	16-41	35-50	15-35	5.6-7.8	0-1	0-1	0-2	0-1
	41-80	27-39	10-25	6.6-8.4	5-20	0-2	0-4	0-2
Ws:								
Woonsocket-----	0-9	5-20	10-15	6.1-7.3	0	0	0-2	0
	9-25	18-35	10-15	6.1-7.8	0-3	0	0-4	5-15
	25-80	5-10	3-6	7.4-8.4	0-10	0	4-8	5-15
Whitelake-----	0-8	5-15	4-15	5.6-7.8	0	0	0-2	0-5
	8-12	5-15	4-13	5.6-7.8	0	0	0-2	0-5
	12-21	18-35	12-26	6.6-9.6	0-15	0-5	4-16	5-15
	21-80	10-25	7-18	7.4-9.6	1-15	0-5	2-8	5-15
Wt:								
Worthing-----	0-10	35-40	21-33	5.6-7.3	0	0	0-2	0
	10-45	40-60	20-30	6.1-7.3	0-5	0	0-2	0
	45-60	30-50	16-24	6.6-8.4	0-15	0-2	2-8	0-1
Ww:								
Worthing, ponded-----	0-10	35-40	21-33	5.6-7.3	0	0	0-2	0
	10-45	40-60	20-30	6.1-7.3	0-5	0	0-2	0
	45-60	30-50	16-24	6.6-8.4	0-15	0-2	2-8	0-1

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	Pct	meq/100 g	pH	Pct	Pct	mmhos/cm	
ZaE:								
Zahill-----	0-3	20-27	15-20	7.4-8.4	5-15	0	0	0
	3-18	25-35	15-20	7.4-8.4	10-25	0	0-2	0
	18-80	20-35	15-20	7.4-9.0	5-20	0	0-4	0
ZbC:								
Zahl-----	0-8	18-27	10-20	6.6-8.4	1-10	0	0-2	0
	8-29	20-30	10-15	7.4-8.4	15-25	0-2	0-4	0
	29-80	20-30	10-15	7.4-8.4	5-25	0-2	0-4	0
Max-----	0-14	18-27	15-26	6.6-7.8	0	0	0-2	0
	14-80	18-35	11-16	7.4-8.4	10-30	0	0-4	0
ZbD:								
Zahl-----	0-8	18-27	10-20	6.6-8.4	1-10	0	0-2	0
	8-29	20-30	10-15	7.4-8.4	15-25	0-2	0-4	0
	29-80	20-30	10-15	7.4-8.4	5-25	0-2	0-4	0
Max-----	0-14	18-27	15-26	6.6-7.8	0	0	0-2	0
	14-80	18-35	11-16	7.4-8.4	10-30	0	0-4	0
ZgD:								
Zell-----	0-7	10-18	15-25	6.6-8.4	0-5	0	0-2	0
	7-31	10-18	10-20	7.4-8.4	15-30	0	0-2	0
	31-80	5-18	10-20	7.4-9.0	10-25	0-1	0-4	0-3
Great Bend-----	0-7	20-26	13-22	6.1-7.8	0	0	0-2	0
	7-12	18-30	12-20	6.6-8.4	0-5	0	0-2	0
	12-32	18-30	10-16	7.4-8.4	10-25	0	0-2	0
	32-53	18-25	9-14	7.4-8.4	10-25	0-2	0-4	0
	53-80	18-25	9-14	7.4-8.4	10-25	0-2	0-8	0

Water Features

(Dashes (--) indicate that an assignment has not been made. Depths of layers are in feet)

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Aa: Aastad-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	36-60	> 80	---	---	None	---	None
		May	36-60	> 80	---	---	None	---	None
		June	36-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Ab: Aastad-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	36-60	> 80	---	---	None	---	None
		May	36-60	> 80	---	---	None	---	None
		June	36-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Hamerly-----	C	January	36-60	> 80	---	---	None	---	None
		February	36-60	> 80	---	---	None	---	None
		March	36-60	> 80	---	---	None	---	None
		April	18-42	> 80	---	---	None	---	None
		May	18-42	> 80	---	---	None	---	None
		June	18-42	> 80	---	---	None	---	None
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	36-60	> 80	---	---	None	---	None
		November	36-60	> 80	---	---	None	---	None
		December	36-60	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Ad: Aastad-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	36-60	> 80	---	---	None	---	None
		May	36-60	> 80	---	---	None	---	None
		June	36-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Tonka-----	C/D	January	18-42	> 80	---	---	---	---	None
		February	18-42	> 80	---	---	---	---	None
		March	0	> 80	0-6	Long	Frequent	---	None
		April	0	> 80	0-6	Long	Frequent	---	None
		May	0	> 80	0-6	Long	Frequent	---	None
		June	0	> 80	0-6	Long	Frequent	---	None
		July	0	> 80	0-6	Long	Frequent	---	None
		August	24-60	> 80	---	---	---	---	None
		September	24-60	> 80	---	---	---	---	None
		October	18-42	> 80	---	---	---	---	None
		November	18-42	> 80	---	---	---	---	None
		December	18-42	> 80	---	---	---	---	None
Ae: Aberdeen-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Ae: (cont.) Nahon-----	D	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Ah: Aberdeen-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Nahon-----	D	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
An: Aberdeen-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Nahon-----	D	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Heil-----	D	January	24-48	> 80	---	---	None	---	None
		February	24-48	> 80	---	---	None	---	None
		March	24-48	> 80	---	---	None	---	None
		April	0-18	> 80	0-12	Long	Frequent	---	None
		May	0-18	> 80	0-12	Long	Frequent	---	None
		June	0-18	> 80	0-12	Long	Frequent	---	None
		July	0-18	> 80	0-12	Long	Frequent	---	None
		August	24-60	> 80	---	---	None	---	None
		September	24-60	> 80	---	---	None	---	None
		October	24-48	> 80	---	---	None	---	None
		November	24-48	> 80	---	---	None	---	None
		December	24-48	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Ao: Aberdeen-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Nahon-----	D	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Heil-----	D	January	24-48	> 80	---	---	None	---	None
		February	24-48	> 80	---	---	None	---	None
		March	24-48	> 80	---	---	None	---	None
		April	0-18	> 80	0-12	Long	Frequent	---	None
		May	0-18	> 80	0-12	Long	Frequent	---	None
		June	0-18	> 80	0-12	Long	Frequent	---	None
		July	0-18	> 80	0-12	Long	Frequent	---	None
		August	24-60	> 80	---	---	None	---	None
		September	24-60	> 80	---	---	None	---	None
		October	24-48	> 80	---	---	None	---	None
		November	24-48	> 80	---	---	None	---	None
		December	24-48	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
At: Aguents, loamy-----	D	All months	0-24	> 80	0-24	Very long	Frequent	---	None
BaC: Beadle-----	C	All months	---	---	---	---	None	---	None
BdA: Beadle-----	C	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
Dudley-----	D	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	42-60	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
BeA: Beadle-----	C	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
BeA: (cont.) Stickney-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	42-60	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
BeB: Beadle-----	C	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
Stickney-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	42-60	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
BfA: Beadle, stony-----	C	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
BfA: (cont.) Stickney, stony-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	42-60	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
BfB: Beadle, stony-----	C	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
Stickney, stony-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	42-60	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None

Water Features---Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Bg: Bearden-----	C	January	36-60	> 80	---	---	None	---	None
		February	36-60	> 80	---	---	None	---	None
		March	36-60	> 80	---	---	None	---	None
		April	18-42	> 80	---	---	None	---	None
		May	18-42	> 80	---	---	None	---	None
		June	18-42	> 80	---	---	None	---	None
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	36-60	> 80	---	---	None	---	None
		November	36-60	> 80	---	---	None	---	None
		December	36-60	> 80	---	---	None	---	None
Bk: Bearden-----	C	January	36-60	> 80	---	---	None	---	None
		February	36-60	> 80	---	---	None	---	None
		March	36-60	> 80	---	---	None	---	None
		April	18-42	> 80	---	---	None	---	None
		May	18-42	> 80	---	---	None	---	None
		June	18-42	> 80	---	---	None	---	None
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	36-60	> 80	---	---	None	---	None
		November	36-60	> 80	---	---	None	---	None
		December	36-60	> 80	---	---	None	---	None
Tonka-----	C/D	January	18-42	> 80	---	---	---	---	None
		February	18-42	> 80	---	---	---	---	None
		March	0	> 80	0-6	Long	Frequent	---	None
		April	0	> 80	0-6	Long	Frequent	---	None
		May	0	> 80	0-6	Long	Frequent	---	None
		June	0	> 80	0-6	Long	Frequent	---	None
		July	0	> 80	0-6	Long	Frequent	---	None
		August	24-60	> 80	---	---	---	---	None
		September	24-60	> 80	---	---	---	---	None
		October	18-42	> 80	---	---	---	---	None
		November	18-42	> 80	---	---	---	---	None
		December	18-42	> 80	---	---	---	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Bo: Beotia-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
Br: Beotia-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
Rondell-----	B	January	42-60	> 80	---	---	None	---	None
		February	42-60	> 80	---	---	None	---	None
		March	42-60	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	42-60	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	42-60	> 80	---	---	None	---	None
		November	42-60	> 80	---	---	None	---	None
		December	42-60	> 80	---	---	None	---	None
Bs: Beotia-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Bs: (cont.) Winship-----	C	January	36-60	> 80	---	---	None	---	None
		February	36-60	> 80	---	---	None	---	None
		March	36-60	> 80	---	---	None	---	None
		April	18-42	> 80	---	---	None	---	None
		May	18-42	> 80	---	---	None	---	None
		June	18-42	> 80	---	---	None	---	None
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	36-60	> 80	---	---	None	---	None
		November	36-60	> 80	---	---	None	---	None
		December	36-60	> 80	---	---	None	---	None
Bt: Beotia-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Winship-----	C	January	36-60	> 80	---	---	None	---	None
		February	36-60	> 80	---	---	None	---	None
		March	36-60	> 80	---	---	None	---	None
		April	18-42	> 80	---	---	None	---	None
		May	18-42	> 80	---	---	None	---	None
		June	18-42	> 80	---	---	None	---	None
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	36-60	> 80	---	---	None	---	None
		November	36-60	> 80	---	---	None	---	None
		December	36-60	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Bu: Bon-----	B	January	36-60	> 80	---	---	None	---	None
		February	36-60	> 80	---	---	None	---	None
		March	36-60	> 80	---	---	None	Brief	Rare
		April	36-60	> 80	---	---	None	Brief	Rare
		May	36-60	> 80	---	---	None	Brief	Rare
		June	36-60	> 80	---	---	None	Brief	Rare
		July	36-60	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	36-60	> 80	---	---	None	---	None
		November	36-60	> 80	---	---	None	---	None
		December	36-60	> 80	---	---	None	---	None
Bw: Bon, channeled-----	B	January	36-60	> 80	---	---	None	---	None
		February	36-60	> 80	---	---	None	---	None
		March	36-60	> 80	---	---	None	Brief	Frequent
		April	36-60	> 80	---	---	None	Brief	Frequent
		May	36-60	> 80	---	---	None	Brief	Frequent
		June	36-60	> 80	---	---	None	Brief	Frequent
		July	36-60	> 80	---	---	None	Brief	Frequent
		August	48-72	> 80	---	---	None	Brief	Frequent
		September	48-72	> 80	---	---	None	Brief	Frequent
		October	36-60	> 80	---	---	None	Brief	Frequent
		November	36-60	> 80	---	---	None	---	None
		December	36-60	> 80	---	---	None	---	None
BxD: Buse-----	B	All months	---	---	---	---	None	---	None
Barnes-----	B	All months	---	---	---	---	None	---	None
ByE: Buse, stony-----	B	All months	---	---	---	---	None	---	None
Barnes, stony-----	B	All months	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
BzE: Buse-----	B	All months	---	---	---	---	None	---	None
Langhei-----	B	All months	---	---	---	---	None	---	None
Ca: Camtown-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Turton-----	D	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Cf: Cavour-----	D	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Ferney-----	D	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Co: Colvin, saline-----	C/D	January	24-48	> 80	---	---	---	---	None
		February	24-48	> 80	---	---	---	---	None
		March	24-48	> 80	0-6	Long	Occasional	---	None
		April	0-18	> 80	0-6	Long	Occasional	---	None
		May	0-18	> 80	0-6	Long	Occasional	---	None
		June	0-18	> 80	0-6	Long	Occasional	---	None
		July	0-18	> 80	0-6	Long	Occasional	---	None
		August	24-48	> 80	---	---	---	---	None
		September	24-48	> 80	---	---	---	---	None
		October	24-48	> 80	---	---	---	---	None
		November	24-48	> 80	---	---	---	---	None
		December	24-48	> 80	---	---	---	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Cr: Cresbard-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Cavour-----	D	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Cs: Cresbard-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Cs: (cont.) Cavour-----	D	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Heil-----	D	January	24-48	> 80	---	---	None	---	None
		February	24-48	> 80	---	---	None	---	None
		March	24-48	> 80	---	---	None	---	None
		April	0-18	> 80	0-12	Long	Frequent	---	None
		May	0-18	> 80	0-12	Long	Frequent	---	None
		June	0-18	> 80	0-12	Long	Frequent	---	None
		July	0-18	> 80	0-12	Long	Frequent	---	None
		August	24-60	> 80	---	---	None	---	None
		September	24-60	> 80	---	---	None	---	None
		October	24-48	> 80	---	---	None	---	None
		November	24-48	> 80	---	---	None	---	None
		December	24-48	> 80	---	---	None	---	None
Ct: Crossplain-----	C	January	24-48	> 80	---	---	None	---	None
		February	24-48	> 80	---	---	None	---	None
		March	0-24	> 80	---	---	None	Brief	Frequent
		April	0-24	> 80	---	---	None	Brief	Frequent
		May	0-24	> 80	---	---	None	Brief	Frequent
		June	0-24	> 80	---	---	None	Brief	Frequent
		July	24-48	> 80	---	---	None	---	None
		August	24-48	> 80	---	---	None	---	None
		September	24-48	> 80	---	---	None	---	None
		October	24-48	> 80	---	---	None	---	None
		November	24-48	> 80	---	---	None	---	None
		December	24-48	> 80	---	---	None	---	None

Water Features---Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Ct: (cont.) Tetonka-----	C/D	January	18-42	> 80	---	---	None	---	None
		February	18-42	> 80	---	---	None	---	None
		March	0-12	> 80	0-12	Long	Frequent	---	None
		April	0-12	> 80	0-12	Long	Frequent	---	None
		May	0-12	> 80	0-12	Long	Frequent	---	None
		June	0-12	> 80	0-12	Long	Frequent	---	None
		July	18-42	> 80	---	---	None	---	None
		August	24-60	> 80	---	---	None	---	None
		September	24-60	> 80	---	---	None	---	None
		October	18-42	> 80	---	---	None	---	None
		November	18-42	> 80	---	---	None	---	None
		December	18-42	> 80	---	---	None	---	None
Da: Davis-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	36-60	> 80	---	---	None	Brief	Rare
		April	36-60	> 80	---	---	None	Brief	Rare
		May	36-60	> 80	---	---	None	Brief	Rare
		June	36-60	> 80	---	---	None	Brief	Rare
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Northville-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	36-60	> 80	---	---	None	Brief	Rare
		April	36-60	> 80	---	---	None	Brief	Rare
		May	36-60	> 80	---	---	None	Brief	Rare
		June	36-60	> 80	---	---	None	Brief	Rare
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Db: Davison-----	B	January	36-60	> 80	---	---	None	---	None
		February	36-60	> 80	---	---	None	---	None
		March	18-48	> 80	---	---	None	---	None
		April	18-48	> 80	---	---	None	---	None
		May	18-48	> 80	---	---	None	---	None
		June	18-48	> 80	---	---	None	---	None
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	36-60	> 80	---	---	None	---	None
		November	36-60	> 80	---	---	None	---	None
		December	36-60	> 80	---	---	None	---	None
Dd: Davison-----	B	January	36-60	> 80	---	---	None	---	None
		February	36-60	> 80	---	---	None	---	None
		March	18-48	> 80	---	---	None	---	None
		April	18-48	> 80	---	---	None	---	None
		May	18-48	> 80	---	---	None	---	None
		June	18-48	> 80	---	---	None	---	None
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	36-60	> 80	---	---	None	---	None
		November	36-60	> 80	---	---	None	---	None
		December	36-60	> 80	---	---	None	---	None
Tetonka-----	C/D	January	18-42	> 80	---	---	None	---	None
		February	18-42	> 80	---	---	None	---	None
		March	0-12	> 80	0-12	Long	Frequent	---	None
		April	0-12	> 80	0-12	Long	Frequent	---	None
		May	0-12	> 80	0-12	Long	Frequent	---	None
		June	0-12	> 80	0-12	Long	Frequent	---	None
		July	18-42	> 80	---	---	None	---	None
		August	24-60	> 80	---	---	None	---	None
		September	24-60	> 80	---	---	None	---	None
		October	18-42	> 80	---	---	None	---	None
		November	18-42	> 80	---	---	None	---	None
		December	18-42	> 80	---	---	None	---	None

Water Features---Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
DeA: Delmont-----	B	All months	---	---	---	---	None	---	None
Enet-----	B	All months	---	---	---	---	None	---	None
Dk: Dimo-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	36-60	> 80	---	---	None	Brief	Rare
		April	36-60	> 80	---	---	None	Brief	Rare
		May	36-60	> 80	---	---	None	Brief	Rare
		June	36-60	> 80	---	---	None	Brief	Rare
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Dm: Dimo-----	B	January	36-60	> 80	---	---	None	---	None
		February	36-60	> 80	---	---	None	---	None
		March	18-36	> 80	---	---	None	Brief	Rare
		April	18-36	> 80	---	---	None	Brief	Rare
		May	18-36	> 80	---	---	None	Brief	Rare
		June	18-36	> 80	---	---	None	Brief	Rare
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	36-60	> 80	---	---	None	---	None
		November	36-60	> 80	---	---	None	---	None
		December	36-60	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Dm: (cont.) Grat-----	D	January	18-42	> 80	---	---	None	---	None
		February	18-42	> 80	---	---	None	---	None
		March	0-24	> 80	0-12	Long	Occasional	---	None
		April	0-24	> 80	0-12	Long	Occasional	---	None
		May	0-24	> 80	0-12	Long	Occasional	---	None
		June	0-24	> 80	0-12	Long	Occasional	---	None
		July	18-42	> 80	---	---	None	---	None
		August	24-48	> 80	---	---	None	---	None
		September	24-48	> 80	---	---	None	---	None
		October	18-42	> 80	---	---	None	---	None
		November	18-42	> 80	---	---	None	---	None
		December	18-42	> 80	---	---	None	---	None
DoA: Doland-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
Embden-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	36-60	> 80	---	---	None	---	None
		May	36-60	> 80	---	---	None	---	None
		June	36-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None

Water Features---Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Dq: Dovecreek-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	48-72	---	---	None	Brief	Rare
		May	42-60	48-72	---	---	None	Brief	Rare
		June	42-60	48-72	---	---	None	Brief	Rare
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Dr: Dovray-----	D	January	0-36	> 80	0-12	Very long	Frequent	---	None
		February	0-36	> 80	0-12	Very long	Frequent	---	None
		March	0-36	> 80	0-12	Very long	Frequent	---	None
		April	0-6	> 80	0-24	Very long	Frequent	---	None
		May	0-6	> 80	0-24	Very long	Frequent	---	None
		June	0-6	> 80	0-24	Very long	Frequent	---	None
		July	0-36	> 80	0-12	Very long	Frequent	---	None
		August	0-36	> 80	0-12	Very long	Frequent	---	None
		September	0-36	> 80	0-12	Very long	Frequent	---	None
		October	0-36	> 80	0-12	Very long	Frequent	---	None
		November	0-36	> 80	0-12	Very long	Frequent	---	None
		December	0-36	> 80	0-12	Very long	Frequent	---	None
Du: Dudley-----	D	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	42-60	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Du: (cont.) Jerauld-----	D	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	42-60	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Dx: Durrstein-----	D	January	18-42	> 80	---	---	None	---	None
		February	18-42	> 80	---	---	None	---	None
		March	0-18	> 80	---	---	None	Brief	Frequent
		April	0-18	> 80	---	---	None	Brief	Frequent
		May	0-18	> 80	---	---	None	Brief	Frequent
		June	0-18	> 80	---	---	None	Brief	Frequent
		July	0-18	> 80	---	---	None	---	None
		August	18-42	> 80	---	---	None	---	None
		September	18-42	> 80	---	---	None	---	None
		October	18-42	> 80	---	---	None	---	None
		November	18-42	> 80	---	---	None	---	None
		December	18-42	> 80	---	---	None	---	None
Ea: Eckman-----	B	All months	---	---	---	---	None	---	None
EcA: Eckman-----	B	All months	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
EcA: (cont.) Gardena-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	36-60	> 80	---	---	None	---	None
		May	36-60	> 80	---	---	None	---	None
		June	36-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
EcB: Eckman-----	B	All months	---	---	---	---	None	---	None
Gardena-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	36-60	> 80	---	---	None	---	None
		May	36-60	> 80	---	---	None	---	None
		June	36-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
EdB: Eckman-----	B	All months	---	---	---	---	None	---	None
Zell-----	B	All months	---	---	---	---	None	---	None
EeB: Edgeley-----	C	All months	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
FeC: Edgeley-----	C	All months	---	---	---	---	None	---	None
FeD: Edgeley-----	C	All months	---	---	---	---	None	---	None
EgA: Egeland-----	B	All months	---	---	---	---	None	---	None
Embden-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	36-60	> 80	---	---	None	---	None
		May	36-60	> 80	---	---	None	---	None
		June	36-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
EgB: Egeland-----	B	All months	---	---	---	---	None	---	None
Embden-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	36-60	> 80	---	---	None	---	None
		May	36-60	> 80	---	---	None	---	None
		June	36-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Ek: Elsmere-----	A	January	24-60	> 80	---	---	None	---	None
		February	24-60	> 80	---	---	None	---	None
		March	18-36	> 80	---	---	None	---	None
		April	18-36	> 80	---	---	None	---	None
		May	18-36	> 80	---	---	None	---	None
		June	18-36	> 80	---	---	None	---	None
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	24-60	> 80	---	---	None	---	None
		November	24-60	> 80	---	---	None	---	None
		December	24-60	> 80	---	---	None	---	None
EmE: Ethan-----	B	All months	---	---	---	---	None	---	None
Betts-----		All months	---	---	---	---	None	---	None
EnD: Ethan-----	B	All months	---	---	---	---	None	---	None
Hand-----		All months	---	---	---	---	None	---	None
Er: Exline-----	D	January	36-60	> 80	---	---	None	---	None
		February	36-60	> 80	---	---	None	---	None
		March	36-60	> 80	---	---	None	---	None
		April	18-42	> 80	---	---	None	---	None
		May	18-42	> 80	---	---	None	---	None
		June	18-42	> 80	---	---	None	---	None
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	36-60	> 80	---	---	None	---	None
		November	36-60	> 80	---	---	None	---	None
		December	36-60	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Er: (cont.) Aberdeen-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Nahon-----	D	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Et: Exline-----	D	January	36-60	> 80	---	---	None	---	None
		February	36-60	> 80	---	---	None	---	None
		March	36-60	> 80	---	---	None	---	None
		April	18-42	> 80	---	---	None	---	None
		May	18-42	> 80	---	---	None	---	None
		June	18-42	> 80	---	---	None	---	None
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	36-60	> 80	---	---	None	---	None
		November	36-60	> 80	---	---	None	---	None
		December	36-60	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Et: (cont.) Aberdeen-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Nahon-----	D	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Ew: Exline-----	D	January	36-60	> 80	---	---	None	---	None
		February	36-60	> 80	---	---	None	---	None
		March	36-60	> 80	---	---	None	---	None
		April	18-42	> 80	---	---	None	---	None
		May	18-42	> 80	---	---	None	---	None
		June	18-42	> 80	---	---	None	---	None
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	36-60	> 80	---	---	None	---	None
		November	36-60	> 80	---	---	None	---	None
		December	36-60	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Ew: (cont.) Heil-----	D	January	24-48	> 80	---	---	None	---	None
		February	24-48	> 80	---	---	None	---	None
		March	24-48	> 80	---	---	None	---	None
		April	0-18	> 80	0-12	Long	Frequent	---	None
		May	0-18	> 80	0-12	Long	Frequent	---	None
		June	0-18	> 80	0-12	Long	Frequent	---	None
		July	0-18	> 80	0-12	Long	Frequent	---	None
		August	24-60	> 80	---	---	None	---	None
		September	24-60	> 80	---	---	None	---	None
		October	24-48	> 80	---	---	None	---	None
		November	24-48	> 80	---	---	None	---	None
		December	24-48	> 80	---	---	None	---	None
Ex: Exline-----	D	January	36-60	> 80	---	---	None	---	None
		February	36-60	> 80	---	---	None	---	None
		March	36-60	> 80	---	---	None	---	None
		April	18-42	> 80	---	---	None	---	None
		May	18-42	> 80	---	---	None	---	None
		June	18-42	> 80	---	---	None	---	None
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	36-60	> 80	---	---	None	---	None
		November	36-60	> 80	---	---	None	---	None
		December	36-60	> 80	---	---	None	---	None
Heil-----	D	January	24-48	> 80	---	---	None	---	None
		February	24-48	> 80	---	---	None	---	None
		March	24-48	> 80	---	---	None	---	None
		April	0-18	> 80	0-12	Long	Frequent	---	None
		May	0-18	> 80	0-12	Long	Frequent	---	None
		June	0-18	> 80	0-12	Long	Frequent	---	None
		July	0-18	> 80	0-12	Long	Frequent	---	None
		August	24-60	> 80	---	---	None	---	None
		September	24-60	> 80	---	---	None	---	None
		October	24-48	> 80	---	---	None	---	None
		November	24-48	> 80	---	---	None	---	None
		December	24-48	> 80	---	---	None	---	None

Water Features---Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
EyA: Exline-----	D	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Putney-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
Fa: Farmsworth-----	D	January	18-36	> 80	---	---	None	---	None
		February	18-36	> 80	---	---	None	---	None
		March	18-36	> 80	---	---	None	Brief	Rare
		April	18-36	> 80	---	---	None	Brief	Rare
		May	18-36	> 80	---	---	None	Brief	Rare
		June	18-36	> 80	---	---	None	Brief	Rare
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	18-36	> 80	---	---	None	---	None
		November	18-36	> 80	---	---	None	---	None
		December	18-36	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Fa: (cont.) Durrstein-----	D	January	18-42	> 80	---	---	None	---	None
		February	18-42	> 80	---	---	None	---	None
		March	0-18	> 80	---	---	None	Brief	Frequent
		April	0-18	> 80	---	---	None	Brief	Frequent
		May	0-18	> 80	---	---	None	Brief	Frequent
		June	0-18	> 80	---	---	None	Brief	Frequent
		July	0-18	> 80	---	---	None	---	None
		August	18-42	> 80	---	---	None	---	None
		September	18-42	> 80	---	---	None	---	None
		October	18-42	> 80	---	---	None	---	None
		November	18-42	> 80	---	---	None	---	None
		December	18-42	> 80	---	---	None	---	None
Fe: Ferney-----	D	January	36-60	> 80	---	---	None	---	None
		February	36-60	> 80	---	---	None	---	None
		March	36-60	> 80	---	---	None	---	None
		April	18-42	> 80	---	---	None	---	None
		May	18-42	> 80	---	---	None	---	None
		June	18-42	> 80	---	---	None	---	None
		July	18-42	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	36-60	> 80	---	---	None	---	None
		November	36-60	> 80	---	---	None	---	None
		December	36-60	> 80	---	---	None	---	None
Heil-----	D	January	24-48	> 80	---	---	None	---	None
		February	24-48	> 80	---	---	None	---	None
		March	24-48	> 80	---	---	None	---	None
		April	0-18	> 80	0-12	Long	Frequent	---	None
		May	0-18	> 80	0-12	Long	Frequent	---	None
		June	0-18	> 80	0-12	Long	Frequent	---	None
		July	0-18	> 80	0-12	Long	Frequent	---	None
		August	24-60	> 80	---	---	None	---	None
		September	24-60	> 80	---	---	None	---	None
		October	24-48	> 80	---	---	None	---	None
		November	24-48	> 80	---	---	None	---	None
		December	24-48	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Ff: Forestburg-----	A	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	30-48	> 80	---	---	None	---	None
		April	30-48	> 80	---	---	None	---	None
		May	30-48	> 80	---	---	None	---	None
		June	30-48	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Elsmere-----	A	January	24-60	> 80	---	---	None	---	None
		February	24-60	> 80	---	---	None	---	None
		March	18-30	> 80	---	---	None	---	None
		April	18-30	> 80	---	---	None	---	None
		May	18-30	> 80	---	---	None	---	None
		June	18-30	> 80	---	---	None	---	None
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	24-60	> 80	---	---	None	---	None
		November	24-60	> 80	---	---	None	---	None
		December	24-60	> 80	---	---	None	---	None
Fh: Forestburg-----	A	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	30-48	> 80	---	---	None	---	None
		April	30-48	> 80	---	---	None	---	None
		May	30-48	> 80	---	---	None	---	None
		June	30-48	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Fh: (cont.) Elsmere-----	A	January	24-60	> 80	---	---	None	---	None
		February	24-60	> 80	---	---	None	---	None
		March	18-30	> 80	---	---	None	---	None
		April	18-30	> 80	---	---	None	---	None
		May	18-30	> 80	---	---	None	---	None
		June	18-30	> 80	---	---	None	---	None
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	24-60	> 80	---	---	None	---	None
		November	24-60	> 80	---	---	None	---	None
		December	24-60	> 80	---	---	None	---	None
Toko-----	C	January	18-42	> 80	---	---	None	---	None
		February	18-42	> 80	---	---	None	---	None
		March	0-18	> 80	0-12	Long	Frequent	---	None
		April	0-18	> 80	0-12	Long	Frequent	---	None
		May	0-18	> 80	0-12	Long	Frequent	---	None
		June	0-18	> 80	0-12	Long	Frequent	---	None
		July	18-42	> 80	---	---	None	---	None
		August	24-60	> 80	---	---	None	---	None
		September	24-60	> 80	---	---	None	---	None
		October	18-42	> 80	---	---	None	---	None
		November	18-42	> 80	---	---	None	---	None
		December	18-42	> 80	---	---	None	---	None
FmA: Forman-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
FmA: (cont.) Aastad-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	36-60	> 80	---	---	None	---	None
		May	36-60	> 80	---	---	None	---	None
		June	36-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
FmB: Forman-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
Aastad-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	36-60	> 80	---	---	None	---	None
		May	36-60	> 80	---	---	None	---	None
		June	36-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
FnC: Forman-----	B	All months	---	---	---	---	None	---	None
Buse-----	B	All months	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
FrB:									
Forman-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
Buse-----	B	All months	---	---	---	---	None	---	None
Aastad-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	36-60	> 80	---	---	None	---	None
		May	36-60	> 80	---	---	None	---	None
		June	36-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
FrC:									
Forman-----	B	All months	---	---	---	---	None	---	None
Buse-----	B	All months	---	---	---	---	None	---	None
Aastad-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	36-60	> 80	---	---	None	---	None
		May	36-60	> 80	---	---	None	---	None
		June	36-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None

Water Features---Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
FsA:									
Forman-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
Cresbard-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
FsB:									
Forman-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
Cresbard-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
FtA:									
Forman-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
FtA: (cont.) Cresbard-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Tonka-----	C/D	January	18-42	> 80	---	---	---	---	None
		February	18-42	> 80	---	---	---	---	None
		March	0	> 80	0-6	Long	Frequent	---	None
		April	0	> 80	0-6	Long	Frequent	---	None
		May	0	> 80	0-6	Long	Frequent	---	None
		June	0	> 80	0-6	Long	Frequent	---	None
		July	0	> 80	0-6	Long	Frequent	---	None
		August	24-60	> 80	---	---	---	---	None
		September	24-60	> 80	---	---	---	---	None
		October	18-42	> 80	---	---	---	---	None
		November	18-42	> 80	---	---	---	---	None
		December	18-42	> 80	---	---	---	---	None
Ga: Gardena-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	36-60	> 80	---	---	None	---	None
		May	36-60	> 80	---	---	None	---	None
		June	36-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None

Water Features---Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Gd: Gardena-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	36-60	> 80	---	---	None	---	None
		May	36-60	> 80	---	---	None	---	None
		June	36-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Glyndon-----	B	January	36-60	> 80	---	---	None	---	None
		February	36-60	> 80	---	---	None	---	None
		March	36-60	> 80	---	---	None	---	None
		April	30-48	> 80	---	---	None	---	None
		May	30-48	> 80	---	---	None	---	None
		June	30-48	> 80	---	---	None	---	None
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	36-60	> 80	---	---	None	---	None
		November	36-60	> 80	---	---	None	---	None
		December	36-60	> 80	---	---	None	---	None
Ge: Gardena-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	36-60	> 80	---	---	None	---	None
		May	36-60	> 80	---	---	None	---	None
		June	36-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Ge: (cont.) Turton-----	D	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
GgA: Great Bend-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
GnA: Great Bend-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
Beotia-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
GnB: Great Bend-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
Beotia-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
GoA: Great Bend-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
Beotia-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
GpA: Great Bend-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
Putney-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
GpB: Great Bend-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
Putney-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
GtB: Great Bend-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
Zell-----	B	All months	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
GtC: Great Bend-----	B	All months	---	---	---	---	None	---	None
Zell-----	B	All months	---	---	---	---	None	---	None
GzC: Great Bend-----	B	All months	---	---	---	---	None	---	None
Zell-----	B	All months	---	---	---	---	None	---	None
Huffton-----	B	All months	---	---	---	---	None	---	None
HaA: Hamerly-----	C	January	36-60	> 80	---	---	None	---	None
		February	36-60	> 80	---	---	None	---	None
		March	36-60	> 80	---	---	None	---	None
		April	18-42	> 80	---	---	None	---	None
		May	18-42	> 80	---	---	None	---	None
		June	18-42	> 80	---	---	None	---	None
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	36-60	> 80	---	---	None	---	None
		November	36-60	> 80	---	---	None	---	None
		December	36-60	> 80	---	---	None	---	None
Hb: Hamerly-----	C	January	36-60	> 80	---	---	None	---	None
		February	36-60	> 80	---	---	None	---	None
		March	36-60	> 80	---	---	None	---	None
		April	18-42	> 80	---	---	None	---	None
		May	18-42	> 80	---	---	None	---	None
		June	18-42	> 80	---	---	None	---	None
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	36-60	> 80	---	---	None	---	None
		November	36-60	> 80	---	---	None	---	None
		December	36-60	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Hb: (cont.) Tonka-----	C/D	January	18-42	> 80	---	---	---	---	None
		February	18-42	> 80	---	---	---	---	None
		March	0	> 80	0-6	Long	Frequent	---	None
		April	0	> 80	0-6	Long	Frequent	---	None
		May	0	> 80	0-6	Long	Frequent	---	None
		June	0	> 80	0-6	Long	Frequent	---	None
		July	0	> 80	0-6	Long	Frequent	---	None
		August	24-60	> 80	---	---	---	---	None
		September	24-60	> 80	---	---	---	---	None
		October	18-42	> 80	---	---	---	---	None
		November	18-42	> 80	---	---	---	---	None
		December	18-42	> 80	---	---	---	---	None
HcA: Hand-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
Bonilla-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	42-60	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
HcB: Hand-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
HcB: (cont.) Bonilla-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	42-60	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
HdA: Hand-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
Carthage-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	36-48	> 80	---	---	None	---	None
		April	36-48	> 80	---	---	None	---	None
		May	36-48	> 80	---	---	None	---	None
		June	36-48	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
He: Hand-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None

Water Features---Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
He: (cont.) Carthage-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	36-48	> 80	---	---	None	---	None
		April	36-48	> 80	---	---	None	---	None
		May	36-48	> 80	---	---	None	---	None
		June	36-48	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Overshue-----	B/D	January	18-42	> 80	---	---	None	---	None
		February	18-42	> 80	---	---	None	---	None
		March	0	> 80	0-12	Long	Occasional	---	None
		April	0	> 80	0-12	Long	Occasional	---	None
		May	0	> 80	0-12	Long	Occasional	---	None
		June	0	> 80	0-12	Long	Occasional	---	None
		July	18-42	> 80	---	---	None	---	None
		August	24-60	> 80	---	---	None	---	None
		September	24-60	> 80	---	---	None	---	None
		October	18-42	> 80	---	---	None	---	None
		November	18-42	> 80	---	---	None	---	None
		December	18-42	> 80	---	---	None	---	None
HfC: Hand-----	B	All months	---	---	---	---	None	---	None
Ethan-----	B	All months	---	---	---	---	None	---	None
HgB: Hand-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
Ethan-----	B	All months	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
HgB: (cont.) Bonilla-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	42-60	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
HgC: Hand-----	B	All months	---	---	---	---	None	---	None
Ethan-----	B	All months	---	---	---	---	None	---	None
Bonilla-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	42-60	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
HhB: Hand-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
Ethan-----	B	All months	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
HhB: (cont.) Carthage-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	36-48	> 80	---	---	None	---	None
		April	36-48	> 80	---	---	None	---	None
		May	36-48	> 80	---	---	None	---	None
		June	36-48	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
HjB: Hand-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
Talmo-----	A	All months	---	---	---	---	None	---	None
HjC: Hand-----		All months	---	---	---	---	None	---	None
Talmo-----	A	All months	---	---	---	---	None	---	None
Hk: Harmony-----		All months	---	---	---	---	None	---	None
	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Hk: (cont.) Aberdeen-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Hm: Harmony-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Aberdeen-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Hn: Harmony-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Beotia-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
Ho: Harmony-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Beotia-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Hp: Harriet-----	D	January	18-42	> 80	---	---	None	---	None
		February	18-42	> 80	---	---	None	---	None
		March	0-12	> 80	---	---	None	Long	Occasional
		April	0-12	> 80	---	---	None	Long	Occasional
		May	0-12	> 80	---	---	None	Long	Occasional
		June	0-12	> 80	---	---	None	Long	Occasional
		July	18-42	> 80	---	---	None	---	None
		August	18-42	> 80	---	---	None	---	None
		September	18-42	> 80	---	---	None	---	None
		October	18-42	> 80	---	---	None	---	None
		November	18-42	> 80	---	---	None	---	None
		December	18-42	> 80	---	---	None	---	None
Hr: Heil-----	D	January	24-48	> 80	---	---	None	---	None
		February	24-48	> 80	---	---	None	---	None
		March	24-48	> 80	---	---	None	---	None
		April	0-18	> 80	0-12	Long	Frequent	---	None
		May	0-18	> 80	0-12	Long	Frequent	---	None
		June	0-18	> 80	0-12	Long	Frequent	---	None
		July	0-18	> 80	0-12	Long	Frequent	---	None
		August	24-60	> 80	---	---	None	---	None
		September	24-60	> 80	---	---	None	---	None
		October	24-48	> 80	---	---	None	---	None
		November	24-48	> 80	---	---	None	---	None
		December	24-48	> 80	---	---	None	---	None
HsA: Henkin-----	B	All months	---	---	---	---	None	---	None
Blendon-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
HsB: Henkin-----	B	All months	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
HsB: (cont.)									
Blendon-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
HtB:									
Houdek-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
Ethan-----	B	All months	---	---	---	---	None	---	None
Prosper-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	42-60	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
HtC:									
Houdek-----	B	All months	---	---	---	---	None	---	None
Ethan-----	B	All months	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
HtC: (cont.) Prosper-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	42-60	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
HuA: Houdek-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
Prosper-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	42-60	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
HuB: Houdek-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
HuB: (cont.) Prosper-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	42-60	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
HwA: Houdek-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
Stickney-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	42-60	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
HxA: Houdek-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
HxA: (cont.) Stickney-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	42-60	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Tetonka-----	C/D	January	18-42	> 80	---	---	None	---	None
		February	18-42	> 80	---	---	None	---	None
		March	0-12	> 80	0-12	Long	Frequent	---	None
		April	0-12	> 80	0-12	Long	Frequent	---	None
		May	0-12	> 80	0-12	Long	Frequent	---	None
		June	0-12	> 80	0-12	Long	Frequent	---	None
		July	18-42	> 80	---	---	None	---	None
		August	24-60	> 80	---	---	None	---	None
		September	24-60	> 80	---	---	None	---	None
		October	18-42	> 80	---	---	None	---	None
		November	18-42	> 80	---	---	None	---	None
		December	18-42	> 80	---	---	None	---	None
Hy: Hoven-----	D	January	24-48	> 80	---	---	None	---	None
		February	24-48	> 80	---	---	None	---	None
		March	0-18	> 80	0-12	Long	Frequent	---	None
		April	0-18	> 80	0-12	Long	Frequent	---	None
		May	0-18	> 80	0-12	Long	Frequent	---	None
		June	0-18	> 80	0-12	Long	Frequent	---	None
		July	0-18	> 80	0-12	Long	Frequent	---	None
		August	24-60	> 80	---	---	None	---	None
		September	24-60	> 80	---	---	None	---	None
		October	24-48	> 80	---	---	None	---	None
		November	24-48	> 80	---	---	None	---	None
		December	24-48	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Ie: Ipage-----	A	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	42-60	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Els-----	A	January	24-60	> 80	---	---	None	---	None
		February	24-60	> 80	---	---	None	---	None
		March	18-36	> 80	---	---	None	---	None
		April	18-36	> 80	---	---	None	---	None
		May	18-36	> 80	---	---	None	---	None
		June	18-36	> 80	---	---	None	---	None
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	24-60	> 80	---	---	None	---	None
		November	24-60	> 80	---	---	None	---	None
		December	24-60	> 80	---	---	None	---	None
Shue-----	C	January	18-42	> 80	---	---	None	---	None
		February	18-42	> 80	---	---	None	---	None
		March	0	> 80	0-12	Long	Frequent	---	None
		April	0	> 80	0-12	Long	Frequent	---	None
		May	0	> 80	0-12	Long	Frequent	---	None
		June	0	> 80	0-12	Long	Frequent	---	None
		July	18-42	> 80	---	---	None	---	None
		August	24-60	> 80	---	---	None	---	None
		September	24-60	> 80	---	---	None	---	None
		October	18-42	> 80	---	---	None	---	None
		November	18-42	> 80	---	---	None	---	None
		December	18-42	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Jh: Jerauld-----	D	January	36-60	> 80	---	---	None	---	None
		February	36-60	> 80	---	---	None	---	None
		March	18-42	> 80	---	---	None	---	None
		April	18-42	> 80	---	---	None	---	None
		May	18-42	> 80	---	---	None	---	None
		June	18-42	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	36-60	> 80	---	---	None	---	None
		November	36-60	> 80	---	---	None	---	None
		December	36-60	> 80	---	---	None	---	None
Hoven-----	D	January	24-48	> 80	---	---	None	---	None
		February	24-48	> 80	---	---	None	---	None
		March	0-18	> 80	0-12	Long	Frequent	---	None
		April	0-18	> 80	0-12	Long	Frequent	---	None
		May	0-18	> 80	0-12	Long	Frequent	---	None
		June	0-18	> 80	0-12	Long	Frequent	---	None
		July	0-18	> 80	0-12	Long	Frequent	---	None
		August	24-60	> 80	---	---	None	---	None
		September	24-60	> 80	---	---	None	---	None
		October	24-48	> 80	---	---	None	---	None
		November	24-48	> 80	---	---	None	---	None
		December	24-48	> 80	---	---	None	---	None
KaA: Kranzburg-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
KaA: (cont.) Brookings-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	36-60	> 80	---	---	None	---	None
		May	36-60	> 80	---	---	None	---	None
		June	36-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
KbB: Kranzburg-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
Brookings-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	36-60	> 80	---	---	None	---	None
		May	36-60	> 80	---	---	None	---	None
		June	36-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Buse-----	B	All months	---	---	---	---	None	---	None
KcA: Kranzburg-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
KcA: (cont.) Cresbard-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
KtA: Kranzburg-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
Cresbard-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None

Water Features---Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
KtA: (cont.) Tonka-----	C/D	January	18-42	> 80	---	---	---	---	None
		February	18-42	> 80	---	---	---	---	None
		March	0	> 80	0-6	Long	Frequent	---	None
		April	0	> 80	0-6	Long	Frequent	---	None
		May	0	> 80	0-6	Long	Frequent	---	None
		June	0	> 80	0-6	Long	Frequent	---	None
		July	0	> 80	0-6	Long	Frequent	---	None
		August	24-60	> 80	---	---	---	---	None
		September	24-60	> 80	---	---	---	---	None
		October	18-42	> 80	---	---	---	---	None
		November	18-42	> 80	---	---	---	---	None
		December	18-42	> 80	---	---	---	---	None
KzB: Kranzburg-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
Zell-----	B	All months	---	---	---	---	None	---	None
Aastad-----									
	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	36-60	> 80	---	---	None	---	None
		May	36-60	> 80	---	---	None	---	None
		June	36-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
La: La Prairie-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	Brief	Rare
		May	42-60	> 80	---	---	None	Brief	Rare
		June	42-60	> 80	---	---	None	Brief	Rare
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Lc: La Prairie, channeled-----	B	January	42-60	> 80	---	---	None	---	None
		February	42-60	> 80	---	---	None	---	None
		March	42-60	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	Brief	Occasional
		May	42-60	> 80	---	---	None	Brief	Occasional
		June	42-60	> 80	---	---	None	Brief	Occasional
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	42-60	> 80	---	---	None	---	None
		November	42-60	> 80	---	---	None	---	None
		December	42-60	> 80	---	---	None	---	None
Holmquist, channeled-----	D	January	6-18	> 80	---	---	None	---	None
		February	6-18	> 80	---	---	None	---	None
		March	6-18	> 80	---	---	None	Brief	Frequent
		April	6-18	> 80	---	---	None	Brief	Frequent
		May	6-18	> 80	---	---	None	Brief	Frequent
		June	6-18	> 80	---	---	None	Brief	Frequent
		July	12-36	> 80	---	---	None	---	None
		August	12-36	> 80	---	---	None	---	None
		September	12-36	> 80	---	---	None	---	None
		October	6-18	> 80	---	---	None	---	None
		November	6-18	> 80	---	---	None	---	None
		December	6-18	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Ld: LaDelle-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	Brief	Rare
		May	42-60	> 80	---	---	None	Brief	Rare
		June	42-60	> 80	---	---	None	Brief	Rare
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Le: LaDelle, channeled-----	B	January	42-60	> 80	---	---	None	---	None
		February	42-60	> 80	---	---	None	---	None
		March	42-60	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	Brief	Frequent
		May	42-60	> 80	---	---	None	Brief	Frequent
		June	42-60	> 80	---	---	None	Brief	Frequent
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	42-60	> 80	---	---	None	---	None
		November	42-60	> 80	---	---	None	---	None
		December	42-60	> 80	---	---	None	---	None
Lk: Lamo-----	C	January	12-36	> 80	---	---	None	---	None
		February	12-36	> 80	---	---	None	---	None
		March	12-36	> 80	---	---	None	Brief	Occasional
		April	12-36	> 80	---	---	None	Brief	Occasional
		May	12-36	> 80	---	---	None	Brief	Occasional
		June	12-36	> 80	---	---	None	Brief	Occasional
		July	24-48	> 80	---	---	None	---	None
		August	24-48	> 80	---	---	None	---	None
		September	24-48	> 80	---	---	None	---	None
		October	12-36	> 80	---	---	None	---	None
		November	12-36	> 80	---	---	None	---	None
		December	12-36	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Ln: Lamoure-----	C	January	0-24	> 80	---	---	None	---	None
		February	0-24	> 80	---	---	None	---	None
		March	0-24	> 80	---	---	None	Brief	Frequent
		April	0-24	> 80	---	---	None	Brief	Frequent
		May	0-24	> 80	---	---	None	Brief	Frequent
		June	0-24	> 80	---	---	None	Brief	Frequent
		July	12-36	> 80	---	---	None	---	None
		August	12-36	> 80	---	---	None	---	None
		September	12-36	> 80	---	---	None	---	None
		October	0-24	> 80	---	---	None	---	None
		November	0-24	> 80	---	---	None	---	None
		December	0-24	> 80	---	---	None	---	None
Ln: Lawet-----	B/D	January	12-24	> 80	---	---	None	---	None
		February	12-24	> 80	---	---	None	---	None
		March	12-24	> 80	---	---	None	Brief	Occasional
		April	12-24	> 80	---	---	None	Brief	Occasional
		May	12-24	> 80	---	---	None	Brief	Occasional
		June	12-24	> 80	---	---	None	Brief	Occasional
		July	24-48	> 80	---	---	None	---	None
		August	24-48	> 80	---	---	None	---	None
		September	24-48	> 80	---	---	None	---	None
		October	24-48	> 80	---	---	None	---	None
		November	12-24	> 80	---	---	None	---	None
		December	12-24	> 80	---	---	None	---	None
Lo: Lawet, wet-----	B/D	January	0-36	> 80	---	---	None	---	None
		February	0-36	> 80	---	---	None	---	None
		March	0-12	> 80	0-12	Very long	Frequent	Long	Occasional
		April	0-12	> 80	0-12	Very long	Frequent	Long	Occasional
		May	0-12	> 80	0-12	Very long	Frequent	Long	Occasional
		June	0-12	> 80	0-12	Very long	Frequent	Long	Occasional
		July	0-36	> 80	---	---	None	---	None
		August	0-36	> 80	---	---	None	---	None
		September	0-36	> 80	---	---	None	---	None
		October	0-36	> 80	---	---	None	---	None
		November	0-36	> 80	---	---	None	---	None
		December	0-36	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Lp: Lawet-----	B/D	January	12-24	> 80	---	---	None	---	None
		February	12-24	> 80	---	---	None	---	None
		March	12-24	> 80	---	---	None	Brief	Occasional
		April	12-24	> 80	---	---	None	Brief	Occasional
		May	12-24	> 80	---	---	None	Brief	Occasional
		June	12-24	> 80	---	---	None	Brief	Occasional
		July	24-48	> 80	---	---	None	---	None
		August	24-48	> 80	---	---	None	---	None
		September	24-48	> 80	---	---	None	---	None
		October	24-48	> 80	---	---	None	---	None
		November	12-24	> 80	---	---	None	---	None
		December	12-24	> 80	---	---	None	---	None
Davison-----	B	January	36-60	> 80	---	---	None	---	None
		February	36-60	> 80	---	---	None	---	None
		March	18-48	> 80	---	---	None	---	None
		April	18-48	> 80	---	---	None	---	None
		May	18-48	> 80	---	---	None	---	None
		June	18-48	> 80	---	---	None	---	None
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	36-60	> 80	---	---	None	---	None
		November	36-60	> 80	---	---	None	---	None
		December	36-60	> 80	---	---	None	---	None
LrA: Lehr-----	B	All months	---	---	---	---	None	---	None
Bowdle-----	B	All months	---	---	---	---	None	---	None
LrB: Lehr-----	B	All months	---	---	---	---	None	---	None
Bowdle-----	B	All months	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Ls: Lowe-----	B/D	January	12-36	> 80	---	---	None	---	None
		February	12-36	> 80	---	---	None	---	None
		March	12-36	> 80	---	---	None	Brief	Occasional
		April	0-18	> 80	---	---	None	Brief	Occasional
		May	0-18	> 80	---	---	None	Brief	Occasional
		June	0-18	> 80	---	---	None	Brief	Occasional
		July	24-48	> 80	---	---	None	---	None
		August	24-48	> 80	---	---	None	---	None
		September	24-48	> 80	---	---	None	---	None
		October	12-36	> 80	---	---	None	---	None
		November	12-36	> 80	---	---	None	---	None
		December	12-36	> 80	---	---	None	---	None
Lt: Ludden-----	D	January	24-48	> 80	---	---	None	---	None
		February	24-48	> 80	---	---	None	---	None
		March	24-48	> 80	---	---	None	---	None
		April	0-18	> 80	---	---	None	Long	Frequent
		May	0-18	> 80	---	---	None	Long	Frequent
		June	0-18	> 80	---	---	None	Long	Frequent
		July	24-60	> 80	---	---	None	Long	Frequent
		August	24-60	> 80	---	---	None	---	None
		September	24-60	> 80	---	---	None	---	None
		October	24-48	> 80	---	---	None	---	None
		November	24-48	> 80	---	---	None	---	None
		December	24-48	> 80	---	---	None	---	None
Lu: Ludden, ponded-----	D	January	0-12	> 80	0-24	Long	Frequent	---	None
		February	0-12	> 80	0-24	Long	Frequent	---	None
		March	0-12	> 80	0-24	Very long	Frequent	Very long	Frequent
		April	0-12	> 80	0-24	Very long	Frequent	Very long	Frequent
		May	0-12	> 80	0-24	Very long	Frequent	Very long	Frequent
		June	0-12	> 80	0-24	Very long	Frequent	Very long	Frequent
		July	0-12	> 80	0-24	Very long	Frequent	---	None
		August	0-24	> 80	0-24	Long	Frequent	---	None
		September	0-24	> 80	0-24	Long	Frequent	---	None
		October	0-24	> 80	0-24	Long	Frequent	---	None
		November	0-12	> 80	0-24	Long	Frequent	---	None
		December	0-12	> 80	0-24	Long	Frequent	---	None

Water Features---Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Lw: Ludden, wet-----	D	January	0-36	> 80	0-12	Long	Frequent	---	None
		February	0-36	> 80	0-12	Long	Frequent	---	None
		March	0-36	> 80	0-12	Long	Frequent	---	None
		April	0-12	> 80	0-12	Very long	Frequent	Long	Frequent
		May	0-12	> 80	0-12	Very long	Frequent	Long	Frequent
		June	0-12	> 80	0-12	Very long	Frequent	Long	Frequent
		July	0-36	> 80	0-12	Long	Frequent	---	None
		August	0-36	> 80	0-12	Long	Frequent	---	None
		September	0-36	> 80	0-12	Long	Frequent	---	None
		October	0-36	> 80	0-12	Long	Frequent	---	None
		November	0-36	> 80	0-12	Long	Frequent	---	None
		December	0-36	> 80	0-12	Long	Frequent	---	None
MaC: Maddock-----	A	All months	---	---	---	---	None	---	None
Egeland-----	B	All months	---	---	---	---	None	---	None
MdA: Max-----	B	All months	---	---	---	---	None	---	None
Arnegard-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
MdB: Max-----	B	All months	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
MdB: (cont.) Arnegard-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
MgB: Max-----	B	All months	---	---	---	---	None	---	None
Arnegard-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Zahl-----	B	All months	---	---	---	---	None	---	None
MnB: Max-----	B	All months	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
MnB: (cont.) Niobell-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Noonan-----	D	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
MxC: Max-----	B	All months	---	---	---	---	None	---	None
Zahl-----		All months	---	---	---	---	None	---	None
Arnegard-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
My: Miranda-----	D	January	36-60	> 80	---	---	None	---	None
		February	36-60	> 80	---	---	None	---	None
		March	36-60	> 80	---	---	None	---	None
		April	18-42	> 80	---	---	None	---	None
		May	18-42	> 80	---	---	None	---	None
		June	18-42	> 80	---	---	None	---	None
		July	18-42	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	36-60	> 80	---	---	None	---	None
		November	36-60	> 80	---	---	None	---	None
		December	36-60	> 80	---	---	None	---	None
Heil-----	D	January	24-48	> 80	---	---	None	---	None
		February	24-48	> 80	---	---	None	---	None
		March	24-48	> 80	---	---	None	---	None
		April	0-18	> 80	0-12	Long	Frequent	---	None
		May	0-18	> 80	0-12	Long	Frequent	---	None
		June	0-18	> 80	0-12	Long	Frequent	---	None
		July	0-18	> 80	0-12	Long	Frequent	---	None
		August	24-60	> 80	---	---	None	---	None
		September	24-60	> 80	---	---	None	---	None
		October	24-48	> 80	---	---	None	---	None
		November	24-48	> 80	---	---	None	---	None
		December	24-48	> 80	---	---	None	---	None
Mz: Moritz-----	C	January	24-60	> 80	---	---	None	---	None
		February	24-60	> 80	---	---	None	---	None
		March	24-60	> 80	---	---	None	---	None
		April	18-36	> 80	---	---	None	Brief	Rare
		May	18-36	> 80	---	---	None	Brief	Rare
		June	18-36	> 80	---	---	None	Brief	Rare
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	24-60	> 80	---	---	None	---	None
		October	24-60	> 80	---	---	None	---	None
		November	24-60	> 80	---	---	None	---	None
		December	24-60	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Mz: (cont.) Lowe-----	B/D	January	12-36	> 80	---	---	None	---	None
		February	12-36	> 80	---	---	None	---	None
		March	12-36	> 80	---	---	None	Brief	Occasional
		April	0-18	> 80	---	---	None	Brief	Occasional
		May	0-18	> 80	---	---	None	Brief	Occasional
		June	0-18	> 80	---	---	None	Brief	Occasional
		July	24-48	> 80	---	---	None	---	None
		August	24-48	> 80	---	---	None	---	None
		September	24-48	> 80	---	---	None	---	None
		October	12-36	> 80	---	---	None	---	None
		November	12-36	> 80	---	---	None	---	None
		December	12-36	> 80	---	---	None	---	None
Na: Nahon-----	D	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Aberdeen-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Na: (cont.) Exline-----	D	January	36-60	> 80	---	---	None	---	None
		February	36-60	> 80	---	---	None	---	None
		March	36-60	> 80	---	---	None	---	None
		April	18-42	> 80	---	---	None	---	None
		May	18-42	> 80	---	---	None	---	None
		June	18-42	> 80	---	---	None	---	None
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	36-60	> 80	---	---	None	---	None
		November	36-60	> 80	---	---	None	---	None
		December	36-60	> 80	---	---	None	---	None
Nb: Nahon-----	D	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Aberdeen-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None

Water Features---Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Nb: (cont.) Exline-----	D	January	36-60	> 80	---	---	None	---	None
		February	36-60	> 80	---	---	None	---	None
		March	36-60	> 80	---	---	None	---	None
		April	18-42	> 80	---	---	None	---	None
		May	18-42	> 80	---	---	None	---	None
		June	18-42	> 80	---	---	None	---	None
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	36-60	> 80	---	---	None	---	None
		November	36-60	> 80	---	---	None	---	None
		December	36-60	> 80	---	---	None	---	None
Nc: Niobell-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Noonan-----	D	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Nd: Niobell-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Noonan-----	D	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Heil-----	D	January	24-48	> 80	---	---	None	---	None
		February	24-48	> 80	---	---	None	---	None
		March	24-48	> 80	---	---	None	---	None
		April	0-18	> 80	0-12	Long	Frequent	---	None
		May	0-18	> 80	0-12	Long	Frequent	---	None
		June	0-18	> 80	0-12	Long	Frequent	---	None
		July	0-18	> 80	0-12	Long	Frequent	---	None
		August	24-60	> 80	---	---	None	---	None
		September	24-60	> 80	---	---	None	---	None
		October	24-48	> 80	---	---	None	---	None
		November	24-48	> 80	---	---	None	---	None
		December	24-48	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
NeA: Niobell-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Noonan-----	D	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Max-----	B	All months	---	---	---	---	None	---	None
Nm: Noonan-----	D	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Nm: (cont.) Miranda-----	D	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Nr: Northville-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	36-60	> 80	---	---	None	Brief	Rare
		April	36-60	> 80	---	---	None	Brief	Rare
		May	36-60	> 80	---	---	None	Brief	Rare
		June	36-60	> 80	---	---	None	Brief	Rare
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Farmsworth-----	D	January	18-36	> 80	---	---	None	---	None
		February	18-36	> 80	---	---	None	---	None
		March	18-36	> 80	---	---	None	Brief	Rare
		April	18-36	> 80	---	---	None	Brief	Rare
		May	18-36	> 80	---	---	None	Brief	Rare
		June	18-36	> 80	---	---	None	Brief	Rare
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	18-36	> 80	---	---	None	---	None
		November	18-36	> 80	---	---	None	---	None
		December	18-36	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Nv: Northville-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	36-60	> 80	---	---	None	Brief	Rare
		April	36-60	> 80	---	---	None	Brief	Rare
		May	36-60	> 80	---	---	None	Brief	Rare
		June	36-60	> 80	---	---	None	Brief	Rare
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Farmsworth-----	D	January	18-36	> 80	---	---	None	---	None
		February	18-36	> 80	---	---	None	---	None
		March	18-36	> 80	---	---	None	Brief	Rare
		April	18-36	> 80	---	---	None	Brief	Rare
		May	18-36	> 80	---	---	None	Brief	Rare
		June	18-36	> 80	---	---	None	Brief	Rare
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	18-36	> 80	---	---	None	---	None
		November	18-36	> 80	---	---	None	---	None
		December	18-36	> 80	---	---	None	---	None
Hoven-----	D	January	24-48	> 80	---	---	None	---	None
		February	24-48	> 80	---	---	None	---	None
		March	0-18	> 80	0-12	Long	Frequent	---	None
		April	0-18	> 80	0-12	Long	Frequent	---	None
		May	0-18	> 80	0-12	Long	Frequent	---	None
		June	0-18	> 80	0-12	Long	Frequent	---	None
		July	0-18	> 80	0-12	Long	Frequent	---	None
		August	24-60	> 80	---	---	None	---	None
		September	24-60	> 80	---	---	None	---	None
		October	24-48	> 80	---	---	None	---	None
		November	24-48	> 80	---	---	None	---	None
		December	24-48	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Ov: Overshue-----	B/D	January	18-42	> 80	---	---	None	---	None
		February	18-42	> 80	---	---	None	---	None
		March	0	> 80	0-12	Long	Occasional	---	None
		April	0	> 80	0-12	Long	Occasional	---	None
		May	0	> 80	0-12	Long	Occasional	---	None
		June	0	> 80	0-12	Long	Occasional	---	None
		July	18-42	> 80	---	---	None	---	None
		August	24-60	> 80	---	---	None	---	None
		September	24-60	> 80	---	---	None	---	None
		October	18-42	> 80	---	---	None	---	None
		November	18-42	> 80	---	---	None	---	None
		December	18-42	> 80	---	---	None	---	None
Pa: Parnell-----	D	All months	0	> 80	0-12	Very long	Frequent	---	None
Pc: Parshall-----	B	All months	---	---	---	---	None	---	None
PeA: Peever-----	C	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
PgB: Peever-----	C	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None
Buse-----	B	All months	---	---	---	---	None	---	None
PoA: Peever-----	C	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
PoA: (cont.) Cavour-----	D	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Pp: Pits, gravel and sand-----	A	All months	---	---	---	---	---	---	---
Pr: Playmoor-----	C/D	January	0-18	> 80	---	---	None	---	None
		February	0-18	> 80	---	---	None	---	None
		March	0-18	> 80	---	---	None	Brief	Frequent
		April	0-18	> 80	---	---	None	Brief	Frequent
		May	0-18	> 80	---	---	None	Brief	Frequent
		June	0-18	> 80	---	---	None	Brief	Frequent
		July	12-36	> 80	---	---	None	---	None
		August	12-36	> 80	---	---	None	---	None
		September	12-36	> 80	---	---	None	---	None
		October	0-18	> 80	---	---	None	---	None
		November	0-18	> 80	---	---	None	---	None
		December	0-18	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Py: Playmoor, channeled-----	C/D	January	0-18	> 80	---	---	None	---	None
		February	0-18	> 80	---	---	None	---	None
		March	0-18	> 80	---	---	None	Brief	Frequent
		April	0-18	> 80	---	---	None	Brief	Frequent
		May	0-18	> 80	---	---	None	Brief	Frequent
		June	0-18	> 80	---	---	None	Brief	Frequent
		July	12-36	> 80	---	---	None	---	None
		August	12-36	> 80	---	---	None	---	None
		September	12-36	> 80	---	---	None	---	None
		October	0-18	> 80	---	---	None	---	None
		November	0-18	> 80	---	---	None	---	None
		December	0-18	> 80	---	---	None	---	None
Lamoure, channeled-----	C	January	0-18	> 80	---	---	None	---	None
		February	0-18	> 80	---	---	None	---	None
		March	0-18	> 80	---	---	None	Brief	Frequent
		April	0-18	> 80	---	---	None	Brief	Frequent
		May	0-18	> 80	---	---	None	Brief	Frequent
		June	0-18	> 80	---	---	None	Brief	Frequent
		July	12-36	> 80	---	---	None	---	None
		August	12-36	> 80	---	---	None	---	None
		September	12-36	> 80	---	---	None	---	None
		October	0-18	> 80	---	---	None	---	None
		November	0-18	> 80	---	---	None	---	None
		December	0-18	> 80	---	---	None	---	None
Ra: Ranslo-----	D	January	18-36	> 80	---	---	None	---	None
		February	18-36	> 80	---	---	None	---	None
		March	18-36	> 80	---	---	None	Brief	Occasional
		April	12-36	> 80	---	---	None	Brief	Occasional
		May	12-36	> 80	---	---	None	Brief	Occasional
		June	12-36	> 80	---	---	None	Brief	Occasional
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	18-36	> 80	---	---	None	---	None
		November	18-36	> 80	---	---	None	---	None
		December	18-36	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Re: Ranslo-----	D	January	18-36	> 80	---	---	None	---	None
		February	18-36	> 80	---	---	None	---	None
		March	18-36	> 80	---	---	None	Brief	Occasional
		April	12-36	> 80	---	---	None	Brief	Occasional
		May	12-36	> 80	---	---	None	Brief	Occasional
		June	12-36	> 80	---	---	None	Brief	Occasional
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	18-36	> 80	---	---	None	---	None
		November	18-36	> 80	---	---	None	---	None
		December	18-36	> 80	---	---	None	---	None
Harriet-----	D	January	18-42	> 80	---	---	None	---	None
		February	18-42	> 80	---	---	None	---	None
		March	0-12	> 80	---	---	None	Long	Occasional
		April	0-12	> 80	---	---	None	Long	Occasional
		May	0-12	> 80	---	---	None	Long	Occasional
		June	0-12	> 80	---	---	None	Long	Occasional
		July	18-42	> 80	---	---	None	---	None
		August	18-42	> 80	---	---	None	---	None
		September	18-42	> 80	---	---	None	---	None
		October	18-42	> 80	---	---	None	---	None
		November	18-42	> 80	---	---	None	---	None
		December	18-42	> 80	---	---	None	---	None
RfA: Renshaw-----	B	All months	---	---	---	---	None	---	None
Fordville-----	B	All months	---	---	---	---	None	---	None
RfB: Renshaw-----	B	All months	---	---	---	---	None	---	None
Fordville-----	B	All months	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
So: Southam-----	D	All months	0-12	> 80	0-60	Very long	Frequent	---	None
St: Stickney-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	42-60	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Dudley-----	D	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	42-60	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None

Water Features---Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Su: Stickney-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	42-60	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Dudley-----	D	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	42-60	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Hoven-----	D	January	24-48	> 80	---	---	None	---	None
		February	24-48	> 80	---	---	None	---	None
		March	0-18	> 80	0-12	Long	Frequent	---	None
		April	0-18	> 80	0-12	Long	Frequent	---	None
		May	0-18	> 80	0-12	Long	Frequent	---	None
		June	0-18	> 80	0-12	Long	Frequent	---	None
		July	0-18	> 80	0-12	Long	Frequent	---	None
		August	24-60	> 80	---	---	None	---	None
		September	24-60	> 80	---	---	None	---	None
		October	24-48	> 80	---	---	None	---	None
		November	24-48	> 80	---	---	None	---	None
		December	24-48	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Sw: Straw, channeled-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	Brief	Frequent
		May	42-60	> 80	---	---	None	Brief	Frequent
		June	42-60	> 80	---	---	None	Brief	Frequent
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Sx: Straw-----	B	April	42-60	> 80	---	---	None	Brief	Rare
		May	42-60	> 80	---	---	None	Brief	Rare
		June	42-60	> 80	---	---	None	Brief	Rare
TbE: Talmo, stony-----	A	All months	---	---	---	---	None	---	None
Ethan, stony-----	B	All months	---	---	---	---	None	---	None
Te: Tetonka-----	C/D	January	18-42	> 80	---	---	None	---	None
		February	18-42	> 80	---	---	None	---	None
		March	0-12	> 80	0-12	Long	Frequent	---	None
		April	0-12	> 80	0-12	Long	Frequent	---	None
		May	0-12	> 80	0-12	Long	Frequent	---	None
		June	0-12	> 80	0-12	Long	Frequent	---	None
		July	18-42	> 80	---	---	None	---	None
		August	24-60	> 80	---	---	None	---	None
		September	24-60	> 80	---	---	None	---	None
		October	18-42	> 80	---	---	None	---	None
		November	18-42	> 80	---	---	None	---	None
		December	18-42	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Tk: Toko-----	C	January	18-42	> 80	---	---	None	---	None
		February	18-42	> 80	---	---	None	---	None
		March	0-18	> 80	0-12	Long	Frequent	---	None
		April	0-18	> 80	0-12	Long	Frequent	---	None
		May	0-18	> 80	0-12	Long	Frequent	---	None
		June	0-18	> 80	0-12	Long	Frequent	---	None
		July	18-42	> 80	---	---	None	---	None
		August	24-60	> 80	---	---	None	---	None
		September	24-60	> 80	---	---	None	---	None
		October	18-42	> 80	---	---	None	---	None
		November	18-42	> 80	---	---	None	---	None
		December	18-42	> 80	---	---	None	---	None
Tm: Toko, wet-----	C	January	0-36	> 80	0-12	Long	Frequent	---	None
		February	0-36	> 80	0-12	Long	Frequent	---	None
		March	0-36	> 80	0-12	Long	Frequent	---	None
		April	0-12	> 80	0-24	Very long	Frequent	---	None
		May	0-12	> 80	0-24	Very long	Frequent	---	None
		June	0-12	> 80	0-24	Very long	Frequent	---	None
		July	0-36	> 80	0-12	Long	Frequent	---	None
		August	0-36	> 80	0-12	Long	Frequent	---	None
		September	0-36	> 80	0-12	Long	Frequent	---	None
		October	0-36	> 80	0-12	Long	Frequent	---	None
		November	0-36	> 80	0-12	Long	Frequent	---	None
		December	0-36	> 80	0-12	Long	Frequent	---	None
Tn: Tonka-----	C/D	January	18-42	> 80	---	---	---	---	None
		February	18-42	> 80	---	---	---	---	None
		March	0	> 80	0-6	Long	Frequent	---	None
		April	0	> 80	0-6	Long	Frequent	---	None
		May	0	> 80	0-6	Long	Frequent	---	None
		June	0	> 80	0-6	Long	Frequent	---	None
		July	0	> 80	0-6	Long	Frequent	---	None
		August	24-60	> 80	---	---	---	---	None
		September	24-60	> 80	---	---	---	---	None
		October	18-42	> 80	---	---	---	---	None
		November	18-42	> 80	---	---	---	---	None
		December	18-42	> 80	---	---	---	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
To: Tonka-----	C/D	January	18-42	> 80	---	---	---	---	None
		February	18-42	> 80	---	---	---	---	None
		March	0	> 80	0-6	Long	Frequent	---	None
		April	0	> 80	0-6	Long	Frequent	---	None
		May	0	> 80	0-6	Long	Frequent	---	None
		June	0	> 80	0-6	Long	Frequent	---	None
		July	0	> 80	0-6	Long	Frequent	---	None
		August	24-60	> 80	---	---	---	---	None
		September	24-60	> 80	---	---	---	---	None
		October	18-42	> 80	---	---	---	---	None
		November	18-42	> 80	---	---	---	---	None
		December	18-42	> 80	---	---	---	---	None
Rimlap-----	C/D	January	18-42	> 80	---	---	None	---	None
		February	18-42	> 80	---	---	None	---	None
		March	18-42	> 80	---	---	None	---	None
		April	0-36	> 80	0-12	Long	Frequent	---	None
		May	0-36	> 80	0-12	Long	Frequent	---	None
		June	0-36	> 80	0-12	Long	Frequent	---	None
		July	18-42	> 80	---	---	None	---	None
		August	24-60	> 80	---	---	None	---	None
		September	24-60	> 80	---	---	None	---	None
		October	18-42	> 80	---	---	None	---	None
		November	18-42	> 80	---	---	None	---	None
		December	18-42	> 80	---	---	None	---	None
Us: Udorthents, silty-----	B	All months	---	---	---	---	None	---	None

Water Features---Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Va: Vallars-----	C	January	12-36	> 80	---	---	None	---	None
		February	12-36	> 80	---	---	None	---	None
		March	12-36	> 80	---	---	None	---	None
		April	6-18	> 80	---	---	None	---	None
		May	6-18	> 80	---	---	None	---	None
		June	6-18	> 80	---	---	None	---	None
		July	24-48	> 80	---	---	None	---	None
		August	24-48	> 80	---	---	None	---	None
		September	24-48	> 80	---	---	None	---	None
		October	12-36	> 80	---	---	None	---	None
		November	12-36	> 80	---	---	None	---	None
		December	12-36	> 80	---	---	None	---	None
Hamerly-----	C	January	36-60	> 80	---	---	None	---	None
		February	36-60	> 80	---	---	None	---	None
		March	36-60	> 80	---	---	None	---	None
		April	18-42	> 80	---	---	None	---	None
		May	18-42	> 80	---	---	None	---	None
		June	18-42	> 80	---	---	None	---	None
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	36-60	> 80	---	---	None	---	None
		November	36-60	> 80	---	---	None	---	None
		December	36-60	> 80	---	---	None	---	None
VgA: Vang-----	B	All months	---	---	---	---	None	---	None
W: Water-----	---	All months	---	---	---	---	---	---	---
WaA: Williams-----	B	All months	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
WaA: (cont.) Bowbells-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
WaB: Williams-----	B	All months	---	---	---	---	None	---	None
Bowbells-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
WbA: Williams-----	B	All months	---	---	---	---	None	---	None

Water Features---Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
WbA: (cont.) Bowbells-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Tonka-----	C/D	January	18-42	> 80	---	---	---	---	None
		February	18-42	> 80	---	---	---	---	None
		March	0	> 80	0-6	Long	Frequent	---	None
		April	0	> 80	0-6	Long	Frequent	---	None
		May	0	> 80	0-6	Long	Frequent	---	None
		June	0	> 80	0-6	Long	Frequent	---	None
		July	0	> 80	0-6	Long	Frequent	---	None
		August	24-60	> 80	---	---	---	---	None
		September	24-60	> 80	---	---	---	---	None
		October	18-42	> 80	---	---	---	---	None
		November	18-42	> 80	---	---	---	---	None
		December	18-42	> 80	---	---	---	---	None
WbB: Williams-----	B	All months	---	---	---	---	None	---	None
Bowbells-----									
	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
WbB: (cont.) Tonka-----	C/D	January	18-42	> 80	---	---	---	---	None
		February	18-42	> 80	---	---	---	---	None
		March	0	> 80	0-6	Long	Frequent	---	None
		April	0	> 80	0-6	Long	Frequent	---	None
		May	0	> 80	0-6	Long	Frequent	---	None
		June	0	> 80	0-6	Long	Frequent	---	None
		July	0	> 80	0-6	Long	Frequent	---	None
		August	24-60	> 80	---	---	---	---	None
		September	24-60	> 80	---	---	---	---	None
		October	18-42	> 80	---	---	---	---	None
		November	18-42	> 80	---	---	---	---	None
		December	18-42	> 80	---	---	---	---	None
WcA: Williams-----	B	All months	---	---	---	---	None	---	None
Niobell-----									
	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
WcB: Williams-----	B	All months	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
WcB: (cont.) Niobell-----	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
WdA: Williams-----	B	All months	---	---	---	---	None	---	None
Niobell-----									
	C	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Tonka-----	C/D	January	18-42	> 80	---	---	---	---	None
		February	18-42	> 80	---	---	---	---	None
		March	0	> 80	0-6	Long	Frequent	---	None
		April	0	> 80	0-6	Long	Frequent	---	None
		May	0	> 80	0-6	Long	Frequent	---	None
		June	0	> 80	0-6	Long	Frequent	---	None
		July	0	> 80	0-6	Long	Frequent	---	None
		August	24-60	> 80	---	---	---	---	None
		September	24-60	> 80	---	---	---	---	None
		October	18-42	> 80	---	---	---	---	None
		November	18-42	> 80	---	---	---	---	None
		December	18-42	> 80	---	---	---	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
WhD: Williams-----	B	All months	---	---	---	---	None	---	None
Vida-----	B	All months	---	---	---	---	None	---	None
WmB: Williams-----	B	All months	---	---	---	---	None	---	None
Zahl-----	B	All months	---	---	---	---	None	---	None
Bowbells-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	48-72	> 80	---	---	None	---	None
		April	42-60	> 80	---	---	None	---	None
		May	42-60	> 80	---	---	None	---	None
		June	42-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
WmC: Williams-----	B	All months	---	---	---	---	None	---	None
Zahl-----	B	All months	---	---	---	---	None	---	None
Bowbells-----	B	April	48-72	> 80	---	---	None	---	None
		May	48-72	> 80	---	---	None	---	None
		June	48-72	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Wn: Winship-----	C	January	36-60	> 80	---	---	None	---	None
		February	36-60	> 80	---	---	None	---	None
		March	36-60	> 80	---	---	None	---	None
		April	18-42	> 80	---	---	None	---	None
		May	18-42	> 80	---	---	None	---	None
		June	18-42	> 80	---	---	None	---	None
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	36-60	> 80	---	---	None	---	None
		November	36-60	> 80	---	---	None	---	None
		December	36-60	> 80	---	---	None	---	None
Tonka-----	C/D	January	18-42	> 80	---	---	---	---	None
		February	18-42	> 80	---	---	---	---	None
		March	0	> 80	0-6	Long	Frequent	---	None
		April	0	> 80	0-6	Long	Frequent	---	None
		May	0	> 80	0-6	Long	Frequent	---	None
		June	0	> 80	0-6	Long	Frequent	---	None
		July	0	> 80	0-6	Long	Frequent	---	None
		August	24-60	> 80	---	---	---	---	None
		September	24-60	> 80	---	---	---	---	None
		October	18-42	> 80	---	---	---	---	None
		November	18-42	> 80	---	---	---	---	None
		December	18-42	> 80	---	---	---	---	None
Wo: Winship-----	C	January	36-60	> 80	---	---	None	---	None
		February	36-60	> 80	---	---	None	---	None
		March	36-60	> 80	---	---	None	---	None
		April	18-42	> 80	---	---	None	---	None
		May	18-42	> 80	---	---	None	---	None
		June	18-42	> 80	---	---	None	---	None
		July	36-60	> 80	---	---	None	---	None
		August	36-60	> 80	---	---	None	---	None
		September	36-60	> 80	---	---	None	---	None
		October	36-60	> 80	---	---	None	---	None
		November	36-60	> 80	---	---	None	---	None
		December	36-60	> 80	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Wo: (cont.) Tonka-----	C/D	January	18-42	> 80	---	---	---	---	None
		February	18-42	> 80	---	---	---	---	None
		March	0	> 80	0-6	Long	Frequent	---	None
		April	0	> 80	0-6	Long	Frequent	---	None
		May	0	> 80	0-6	Long	Frequent	---	None
		June	0	> 80	0-6	Long	Frequent	---	None
		July	0	> 80	0-6	Long	Frequent	---	None
		August	24-60	> 80	---	---	---	---	None
		September	24-60	> 80	---	---	---	---	None
		October	18-42	> 80	---	---	---	---	None
		November	18-42	> 80	---	---	---	---	None
		December	18-42	> 80	---	---	---	---	None
Ws: Woonsocket-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	36-60	> 80	---	---	None	---	None
		April	36-60	> 80	---	---	None	---	None
		May	36-60	> 80	---	---	None	---	None
		June	36-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None
Whitelake-----	B	January	48-72	> 80	---	---	None	---	None
		February	48-72	> 80	---	---	None	---	None
		March	36-60	> 80	---	---	None	---	None
		April	36-60	> 80	---	---	None	---	None
		May	36-60	> 80	---	---	None	---	None
		June	36-60	> 80	---	---	None	---	None
		July	48-72	> 80	---	---	None	---	None
		August	48-72	> 80	---	---	None	---	None
		September	48-72	> 80	---	---	None	---	None
		October	48-72	> 80	---	---	None	---	None
		November	48-72	> 80	---	---	None	---	None
		December	48-72	> 80	---	---	None	---	None

Water Features---Continued

Map symbol and soil name	Hydro- logic group	Month	Water Table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Wt: Worthing-----	D	January	0-36	> 80	0-12	Long	Frequent	---	None
		February	0-36	> 80	0-12	Long	Frequent	---	None
		March	0-36	> 80	0-12	Long	Frequent	---	None
		April	0-12	> 80	0-24	Very long	Frequent	---	None
		May	0-12	> 80	0-24	Very long	Frequent	---	None
		June	0-12	> 80	0-24	Very long	Frequent	---	None
		July	0-36	> 80	0-12	Long	Frequent	---	None
		August	0-36	> 80	0-12	Long	Frequent	---	None
		September	0-36	> 80	0-12	Long	Frequent	---	None
		October	0-36	> 80	0-12	Long	Frequent	---	None
		November	0-36	> 80	0-12	Long	Frequent	---	None
		December	0-36	> 80	0-12	Long	Frequent	---	None
Ww: Worthing, ponded-----	D	All months	0-6	> 80	0-36	Very long	Frequent	---	None
ZaE: Zahill-----	C	All months	---	---	---	---	None	---	None
ZbC: Zahl-----	B	All months	---	---	---	---	None	---	None
Max-----	B	All months	---	---	---	---	None	---	None
ZbD: Zahl-----	B	All months	---	---	---	---	None	---	None
Max-----	B	All months	---	---	---	---	None	---	None
ZgD: Zell-----	B	All months	---	---	---	---	None	---	None
Great Bend-----	B	All months	---	---	---	---	None	---	None

Soil Features

(See text for definitions of terms used in this table. Dashes (---) indicate that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		<i>In</i>			
Aa: Aastad-----	---	---	Moderate	High	Low
Ab: Aastad-----	---	---	Moderate	High	Low
Hamerly-----	---	---	High	High	Low
Ad: Aastad-----	---	---	Moderate	High	Low
Tonka-----	---	---	High	High	Low
Ae: Aberdeen-----	---	---	Moderate	High	Moderate
Nahon-----	Natric	6-17	Moderate	High	Moderate
Ah: Aberdeen-----	---	---	Moderate	High	Moderate
Nahon-----	Natric	6-17	Moderate	High	Moderate
An: Aberdeen-----	---	---	Moderate	High	Moderate
Nahon-----	Natric	6-17	Moderate	High	Moderate
Heil-----	Natric	1-4	High	High	Moderate
Ao: Aberdeen-----	---	---	Moderate	High	Moderate
Nahon-----	Natric	6-17	Moderate	High	Moderate
Heil-----	Natric	1-4	High	High	Moderate
At: Aguents, loamy-----	---	---	High	High	Moderate
BaC: Beadle-----	---	---	Moderate	High	Moderate
BdA: Beadle-----	---	---	Moderate	High	Moderate
Dudley-----	Natric	7-17	Moderate	High	Moderate
BeA: Beadle-----	---	---	Moderate	High	Moderate
Stickney-----	---	---	Moderate	High	Moderate
BeB: Beadle-----	---	---	Moderate	High	Moderate
Stickney-----	---	---	Moderate	High	Moderate

Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		<i>In</i>			
BfA:					
Beadle, stony-----	---	---	Moderate	High	Moderate
Stickney, stony-----	---	---	Moderate	High	Moderate
BfB:					
Beadle, stony-----	---	---	Moderate	High	Moderate
Stickney, stony-----	---	---	Moderate	High	Moderate
Bg:					
Bearden-----	---	---	High	High	Low
Bk:					
Bearden-----	---	---	High	High	Low
Tonka-----	---	---	High	High	Low
Bo:					
Beotia-----	---	---	Moderate	High	Low
Br:					
Beotia-----	---	---	Moderate	High	Low
Rondell-----	---	---	High	High	Low
Bs:					
Beotia-----	---	---	Moderate	High	Low
Winship-----	---	---	High	High	Low
Bt:					
Beotia-----	---	---	Moderate	High	Low
Winship-----	---	---	High	High	Low
Bu:					
Bon-----	---	---	Moderate	Moderate	Low
Bw:					
Bon, channeled-----	---	---	High	Moderate	Low
BxD:					
Buse-----	---	---	Moderate	Moderate	Low
Barnes-----	---	---	Moderate	Moderate	Low
ByE:					
Buse, stony-----	---	---	Moderate	Moderate	Low
Barnes, stony-----	---	---	Moderate	High	Low
BzE:					
Buse-----	---	---	Moderate	Moderate	Low
Langhei-----	---	---	Moderate	Moderate	Low
Ca:					
Camtown-----	---	---	Moderate	High	Moderate
Turton-----	Natric	9-22	Moderate	High	Moderate

Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		<i>In</i>			
Cf:					
Cavour-----	Natric	4-18	Moderate	High	Moderate
Ferney-----	Natric	0-6	Moderate	High	Moderate
Co:					
Colvin, saline-----	---	---	High	High	Moderate
Cr:					
Cresbard-----	---	---	Moderate	High	Moderate
Cavour-----	Natric	4-18	Moderate	High	Moderate
Cs:					
Cresbard-----	---	---	Moderate	High	Moderate
Cavour-----	Natric	4-18	Moderate	High	Moderate
Heil-----	Natric	1-4	High	High	Moderate
Ct:					
Crossplain-----	---	---	High	High	Low
Tetonka-----	---	---	High	High	Low
Da:					
Davis-----	---	---	Moderate	Moderate	Low
Northville-----	---	---	Moderate	High	Moderate
Db:					
Davison-----	---	---	High	High	Low
Dd:					
Davison-----	---	---	High	High	Low
Tetonka-----	---	---	High	High	Low
DeA:					
Delmont-----	Strongly contrasting textural stratification	14-20	Low	Moderate	Low
Enet-----	Strongly contrasting textural stratification	20-40	Low	Moderate	Low
Dk:					
Dimo-----	Strongly contrasting textural stratification	20-40	Moderate	High	Low
Dm:					
Dimo-----	Strongly contrasting textural stratification	20-40	Moderate	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
Dm: (cont.) Grat-----	Strongly contrasting textural stratification	20-40	High	High	Low
DoA: Doland-----	---	---	Moderate	High	Low
Embdn-----	---	---	Moderate	Moderate	Low
Dq: Dovecreek-----	---	---	High	High	Low
Dr: Dovray-----	---	---	High	High	Low
Du: Dudley-----	Natric	7-17	Moderate	High	Moderate
Jerauld-----	Natric	1-5	Moderate	High	Moderate
Dx: Durrstein-----	Natric	0-2	High	High	Moderate
Ea: Eckman-----	---	---	Moderate	Moderate	Low
EcA: Eckman-----	---	---	Moderate	Moderate	Low
Gardena-----	---	---	Moderate	Moderate	Low
EcB: Eckman-----	---	---	Moderate	Moderate	Low
Gardena-----	---	---	Moderate	Moderate	Low
EdB: Eckman-----	---	---	Moderate	Moderate	Low
Zell-----	---	---	Moderate	High	Low
EeB: Edgeley-----	Paralithic bedrock	20-40	Moderate	High	Low
EeC: Edgeley-----	Paralithic bedrock	20-40	Moderate	High	Low
EeD: Edgeley-----	Paralithic bedrock	20-40	Moderate	High	Low
EgA: Egeland-----	---	---	Moderate	Moderate	Low
Embdn-----	---	---	Moderate	Moderate	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		<i>In</i>			
EgB: Egeland-----	---	---	Moderate	Moderate	Low
Embden-----	---	---	Moderate	Moderate	Low
Ek: Elsmere-----	---	---	Moderate	Moderate	Low
EmE: Ethan-----	---	---	Moderate	Moderate	Low
Betts-----	---	---	Moderate	Moderate	Low
EnD: Ethan-----	---	---	Moderate	Moderate	Low
Hand-----	---	---	Moderate	High	Low
Er: Exline-----	Natric	0-6	Moderate	High	Moderate
Aberdeen-----	---	---	Moderate	High	Moderate
Nahon-----	Natric	6-17	Moderate	High	Moderate
Et: Exline-----	Natric	0-6	Moderate	High	Moderate
Aberdeen-----	---	---	Moderate	High	Moderate
Nahon-----	Natric	6-17	Moderate	High	Moderate
Ew: Exline-----	Natric	0-6	Moderate	High	Moderate
Heil-----	Natric	1-4	High	High	Moderate
Ex: Exline-----	Natric	0-6	Moderate	High	Moderate
Heil-----	Natric	1-4	High	High	Moderate
EyA: Exline-----	Natric	0-6	Moderate	High	Moderate
Putney-----	---	---	Moderate	High	Moderate
Fa: Farmsworth-----	Natric	5-12	Moderate	High	Moderate
Durrstein-----	Natric	1-4	High	High	Moderate
Fe: Ferney-----	Natric	0-6	Moderate	High	Moderate
Heil-----	Natric	1-4	High	High	Moderate
Ff: Forestburg-----	---	---	Moderate	Moderate	Low
Elsmere-----	---	---	High	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		<i>In</i>			
Fh:					
Forestburg-----	---	---	Moderate	Moderate	Low
Elsmere-----	---	---	High	High	Low
Toko-----	---	---	High	High	Low
FmA:					
Forman-----	---	---	Moderate	High	Moderate
Aastad-----	---	---	Moderate	High	Low
FmB:					
Forman-----	---	---	Moderate	High	Moderate
Aastad-----	---	---	Moderate	High	Low
FnC:					
Forman-----	---	---	Moderate	High	Moderate
Buse-----	---	---	Moderate	Moderate	Low
FrB:					
Forman-----	---	---	Moderate	High	Moderate
Buse-----	---	---	Moderate	Moderate	Low
Aastad-----	---	---	Moderate	High	Low
FrC:					
Forman-----	---	---	Moderate	High	Moderate
Buse-----	---	---	Moderate	Moderate	Low
Aastad-----	---	---	Moderate	High	Low
FsA:					
Forman-----	---	---	Moderate	High	Moderate
Cresbard-----	---	---	Moderate	High	Moderate
FsB:					
Forman-----	---	---	Moderate	High	Moderate
Cresbard-----	---	---	Moderate	High	Moderate
FtA:					
Forman-----	---	---	Moderate	High	Moderate
Cresbard-----	---	---	Moderate	High	Moderate
Tonka-----	---	---	High	High	Low
Ga:					
Gardena-----	---	---	Moderate	Moderate	Low
Gd:					
Gardena-----	---	---	Moderate	Moderate	Low
Glyndon-----	---	---	High	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		<i>In</i>			
Ge: Gardena-----	---	---	Moderate	Moderate	Low
Turton-----	Natric	9-22	Moderate	High	Moderate
GgA: Great Bend-----	---	---	Moderate	High	Low
GnA: Great Bend-----	---	---	Moderate	High	Low
Beotia-----	---	---	Moderate	High	Low
GnB: Great Bend-----	---	---	Moderate	High	Low
Beotia-----	---	---	Moderate	High	Low
GoA: Great Bend-----	---	---	Moderate	High	Low
Beotia-----	---	---	Moderate	High	Low
GpA: Great Bend-----	---	---	Moderate	High	Low
Putney-----	---	---	Moderate	High	Moderate
GpB: Great Bend-----	---	---	Moderate	High	Low
Putney-----	---	---	Moderate	High	Moderate
GtB: Great Bend-----	---	---	Moderate	High	Low
Zell-----	---	---	Moderate	High	Low
GtC: Great Bend-----	---	---	Moderate	High	Low
Zell-----	---	---	Moderate	High	Low
GzC: Great Bend-----	---	---	Moderate	High	Low
Zell-----	---	---	Moderate	High	Low
Huffton-----	---	---	Moderate	High	Moderate
HaA: Hamerly-----	---	---	High	High	Low
Hb: Hamerly-----	---	---	High	High	Low
Tonka-----	---	---	High	High	Low
HcA: Hand-----	---	---	Moderate	High	Low
Bonilla-----	---	---	Moderate	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		<i>In</i>			
HcB:					
Hand-----	---	---	Moderate	High	Low
Bonilla-----	---	---	Moderate	High	Low
HdA:					
Hand-----	---	---	Moderate	High	Low
Carthage-----	---	---	Moderate	High	Low
He:					
Hand-----	---	---	Moderate	High	Low
Carthage-----	---	---	Moderate	High	Low
Overshue-----	---	---	High	High	Low
HfC:					
Hand-----	---	---	Moderate	High	Low
Ethan-----	---	---	Moderate	Moderate	Low
HgB:					
Hand-----	---	---	Moderate	High	Low
Ethan-----	---	---	Moderate	Moderate	Low
Bonilla-----	---	---	Moderate	High	Low
HgC:					
Hand-----	---	---	Moderate	High	Low
Ethan-----	---	---	Moderate	Moderate	Low
Bonilla-----	---	---	Moderate	High	Low
HhB:					
Hand-----	---	---	Moderate	High	Low
Ethan-----	---	---	Moderate	Moderate	Low
Carthage-----	---	---	Moderate	High	Low
HjB:					
Hand-----	---	---	Moderate	High	Low
Talmo-----	Strongly contrasting textural stratification	5-14	Low	Moderate	Low
HjC:					
Hand-----	---	---	Moderate	High	Low
Talmo-----	Strongly contrasting textural stratification	5-14	Low	Moderate	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		<i>In</i>			
Hk: Harmony-----	---	---	Moderate	High	Moderate
Aberdeen-----	---	---	Moderate	High	Moderate
Hm: Harmony-----	---	---	Moderate	High	Moderate
Aberdeen-----	---	---	Moderate	High	Moderate
Hn: Harmony-----	---	---	Moderate	High	Moderate
Beotia-----	---	---	Moderate	High	Low
Ho: Harmony-----	---	---	Moderate	High	Moderate
Beotia-----	---	---	Moderate	High	Low
Hp: Harriet-----	Natric	0-5	High	High	Moderate
Hr: Heil-----	Natric	1-4	High	High	Moderate
HsA: Henkin-----	---	---	Moderate	Moderate	Low
Blendon-----	---	---	Moderate	Moderate	Low
HsB: Henkin-----	---	---	Moderate	Moderate	Low
Blendon-----	---	---	Moderate	Moderate	Low
HtB: Houdek-----	---	---	Moderate	High	Low
Ethan-----	---	---	Moderate	Moderate	Low
Prosper-----	---	---	Moderate	High	Low
HtC: Houdek-----	---	---	Moderate	High	Low
Ethan-----	---	---	Moderate	Moderate	Low
Prosper-----	---	---	Moderate	High	Low
HuA: Houdek-----	---	---	Moderate	High	Low
Prosper-----	---	---	Moderate	High	Low
HuB: Houdek-----	---	---	Moderate	High	Low
Prosper-----	---	---	Moderate	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top In		Uncoated steel	Concrete
HwA:					
Houdek-----	---	---	Moderate	High	Low
Stickney-----	---	---	Moderate	High	Moderate
HxA:					
Houdek-----	---	---	Moderate	High	Low
Stickney-----	---	---	Moderate	High	Moderate
Tetonka-----	---	---	High	High	Low
Hy:					
Hoven-----	Natric	1-6	High	High	Moderate
Ie:					
Ipage-----	---	---	Moderate	Low	Moderate
Els-----	---	---	Moderate	Moderate	Low
Shue-----	---	---	High	High	Low
Jh:					
Jerauld-----	Natric	1-5	Moderate	High	Moderate
Hoven-----	Natric	1-6	High	High	Moderate
KaA:					
Kranzburg-----	---	---	Moderate	High	Low
Brookings-----	---	---	Moderate	High	Low
KbB:					
Kranzburg-----	---	---	Moderate	High	Low
Brookings-----	---	---	Moderate	High	Low
Buse-----	---	---	Moderate	Moderate	Low
KcA:					
Kranzburg-----	---	---	Moderate	High	Low
Cresbard-----	---	---	Moderate	High	Moderate
KtA:					
Kranzburg-----	---	---	Moderate	High	Low
Cresbard-----	---	---	Moderate	High	Moderate
Tonka-----	---	---	High	High	Low
KzB:					
Kranzburg-----	---	---	Moderate	High	Low
Zell-----	---	---	Moderate	High	Low
Aastad-----	---	---	Moderate	High	Low
La:					
La Prairie-----	---	---	Moderate	Moderate	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		<i>In</i>			
Lc: La Prairie, channeled-----	---	---	High	Moderate	Low
Holmquist, channeled-----	---	---	Moderate	High	Moderate
Ld: LaDelle-----	---	---	Moderate	High	Low
Le: LaDelle, channeled----	---	---	High	High	Low
Lk: Lamo-----	---	---	High	High	Low
Lm: Lamoure-----	---	---	High	High	Moderate
Ln: Lawet-----	---	---	High	High	Moderate
Lo: Lawet, wet-----	---	---	High	High	Moderate
Lp: Lawet-----	---	---	High	High	Moderate
Davison-----	---	---	High	High	Low
LrA: Lehr-----	Strongly contrasting textural stratification	14-20	Low	Moderate	Low
Bowdle-----	Strongly contrasting textural stratification	20-40	Low	Moderate	Low
LrB: Lehr-----	Strongly contrasting textural stratification	14-20	Low	Moderate	Low
Bowdle-----	Strongly contrasting textural stratification	20-40	Low	Moderate	Low
Ls: Lowe-----	---	---	High	High	Low
Lt: Ludden-----	---	---	High	High	Low
Lu: Ludden, ponded-----	---	---	High	High	Low
Lw: Ludden, wet-----	---	---	High	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		<i>In</i>			
M-W: Miscellaneous water----	---	---	---	---	---
MaC: Maddock-----	---	---	Low	Moderate	Low
Egeland-----	---	---	Moderate	Moderate	Low
MdA: Max-----	---	---	Moderate	High	Low
Arnegard-----	---	---	Moderate	High	Low
MdB: Max-----	---	---	Moderate	High	Low
Arnegard-----	---	---	Moderate	High	Low
MgB: Max-----	---	---	Moderate	High	Low
Arnegard-----	---	---	Moderate	High	Low
Zahl-----	---	---	Moderate	Moderate	Low
MnB: Max-----	---	---	Moderate	High	Low
Niobell-----	---	---	Moderate	High	Moderate
Noonan-----	Natric	5-10	Moderate	High	Moderate
MxC: Max-----	---	---	Moderate	High	Low
Zahl-----	---	---	Moderate	Moderate	Low
Arnegard-----	---	---	Moderate	High	Low
My: Miranda-----	Natric	0-5	Moderate	High	Moderate
Heil-----	Natric	1-4	High	High	Moderate
Mz: Moritz-----	---	---	High	High	Low
Lowe-----	---	---	High	High	Low
Na: Nahon-----	Natric	6-17	Moderate	High	Moderate
Aberdeen-----	---	---	Moderate	High	Moderate
Exline-----	Natric	0-6	Moderate	High	Moderate
Nb: Nahon-----	Natric	6-17	Moderate	High	Moderate
Aberdeen-----	---	---	Moderate	High	Moderate
Exline-----	Natric	0-6	Moderate	High	Moderate

Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		<i>In</i>			
Nc:					
Niobell-----	---	---	Moderate	High	Moderate
Noonan-----	Natric	5-10	Moderate	High	Moderate
Nd:					
Niobell-----	---	---	Moderate	High	Moderate
Noonan-----	Natric	5-10	Moderate	High	Moderate
Heil-----	Natric	1-4	High	High	Moderate
NeA:					
Niobell-----	---	---	Moderate	High	Moderate
Noonan-----	Natric	5-10	Moderate	High	Moderate
Max-----	---	---	Moderate	High	Low
Nm:					
Noonan-----	Natric	5-10	Moderate	High	Moderate
Miranda-----	Natric	0-5	Moderate	High	Moderate
Nr:					
Northville-----	---	---	Moderate	High	Moderate
Farmsworth-----	Natric	5-12	Moderate	High	Moderate
Nv:					
Northville-----	---	---	Moderate	High	Moderate
Farmsworth-----	Natric	5-12	Moderate	High	Moderate
Hoven-----	Natric	1-6	High	High	Moderate
Ov:					
Overshue-----	---	---	High	High	Low
Pa:					
Parnell-----	---	---	High	High	Low
Pc:					
Parshall-----	---	---	Moderate	Moderate	Low
PeA:					
Peever-----	---	---	Moderate	High	Moderate
PgB:					
Peever-----	---	---	Moderate	High	Moderate
Buse-----	---	---	Moderate	Moderate	Low
PoA:					
Peever-----	---	---	Moderate	High	Moderate
Cavour-----	Natric	4-18	Moderate	High	Moderate
Pp:					
Pits, gravel and sand--	---	---	Low	Moderate	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		<i>In</i>			
Pr: Playmoor-----	---	---	High	High	High
Py: Playmoor, channeled----	---	---	High	High	High
Lamoure, channeled----	---	---	High	High	Moderate
Ra: Ranslo-----	Natric	2-16	High	High	Moderate
Re: Ranslo-----	Natric	2-16	High	High	Moderate
Harriet-----	Natric	0-5	High	High	Moderate
RfA: Renshaw-----	Strongly contrasting textural stratification	14-20	Low	Moderate	Low
Fordville-----	Strongly contrasting textural stratification	20-36	Low	Moderate	Low
RfB: Renshaw-----	Strongly contrasting textural stratification	14-20	Low	Moderate	Low
Fordville-----	Strongly contrasting textural stratification	20-36	Low	Moderate	Low
So: Southam-----	---	---	High	High	Low
St: Stickney-----	---	---	Moderate	High	Moderate
Dudley-----	Natric	7-17	Moderate	High	Moderate
Su: Stickney-----	---	---	Moderate	High	Moderate
Dudley-----	Natric	7-17	Moderate	High	Moderate
Hoven-----	Natric	1-6	High	High	Moderate
Sw: Straw, channeled-----	---	---	High	High	Low
Sx: Straw-----	---	---	Moderate	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		<i>In</i>			
TbE: Talmo, stony-----	Strongly contrasting textural stratification	5-14	Low	Moderate	Low
Ethan, stony-----	---	---	Moderate	Moderate	Low
Te: Tetonka-----	---	---	High	High	Low
Tk: Toko-----	---	---	High	High	Low
Tm: Toko-----	---	---	High	High	Low
Tn: Tonka-----	---	---	High	High	Low
To: Tonka-----	---	---	High	High	Low
Rimlap-----	---	---	High	High	Low
Us: Udorthents, silty-----	---	---	Moderate	Moderate	Low
Va: Vallars-----	---	---	High	High	Low
Hamerly-----	---	---	High	High	Low
VgA: Vang-----	Strongly contrasting textural stratification	20-36	Moderate	High	Low
W: Water-----	---	---	---	---	---
WaA: Williams-----	---	---	Moderate	High	Low
Bowbells-----	---	---	Moderate	High	Low
WaB: Williams-----	---	---	Moderate	High	Low
Bowbells-----	---	---	Moderate	High	Low
WbA: Williams-----	---	---	Moderate	High	Low
Bowbells-----	---	---	Moderate	High	Low
Tonka-----	---	---	High	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		<i>In</i>			
WbB:					
Williams-----	---	---	Moderate	High	Low
Bowbells-----	---	---	Moderate	High	Low
Tonka-----	---	---	High	High	Low
WcA:					
Williams-----	---	---	Moderate	High	Low
Niobell-----	---	---	Moderate	High	Moderate
WcB:					
Williams-----	---	---	Moderate	High	Low
Niobell-----	---	---	Moderate	High	Moderate
WdA:					
Williams-----	---	---	Moderate	High	Low
Niobell-----	---	---	Moderate	High	Moderate
Tonka-----	---	---	High	High	Low
WhD:					
Williams-----	---	---	Moderate	High	Low
Vida-----	---	---	Moderate	Moderate	Low
WmB:					
Williams-----	---	---	Moderate	High	Low
Zahl-----	---	---	Moderate	Moderate	Low
Bowbells-----	---	---	Moderate	High	Low
WmC:					
Williams-----	---	---	Moderate	High	Low
Zahl-----	---	---	Moderate	Moderate	Low
Bowbells-----	---	---	Moderate	High	Low
Wn:					
Winship-----	---	---	High	High	Low
Tonka-----	---	---	High	High	Low
Wo:					
Winship-----	---	---	High	High	Low
Tonka-----	---	---	High	High	Low
Ws:					
Woonsocket-----	---	---	Moderate	High	Low
Whitelake-----	Natric	9-20	Moderate	High	Moderate
Wt:					
Worthing-----	---	---	High	High	Low

Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		<i>In</i>			
Ww: Worthing, ponded-----	---	---	High	High	Low
ZaE: Zahill-----	---	---	Moderate	Moderate	Low
ZbC: Zahl-----	---	---	Moderate	Moderate	Low
Max-----	---	---	Moderate	High	Low
ZbD: Zahl-----	---	---	Moderate	Moderate	Low
Max-----	---	---	Moderate	High	Low
ZgD: Zell-----	---	---	Moderate	High	Low
Great Bend-----	---	---	Moderate	High	Low

Classification of the Soils

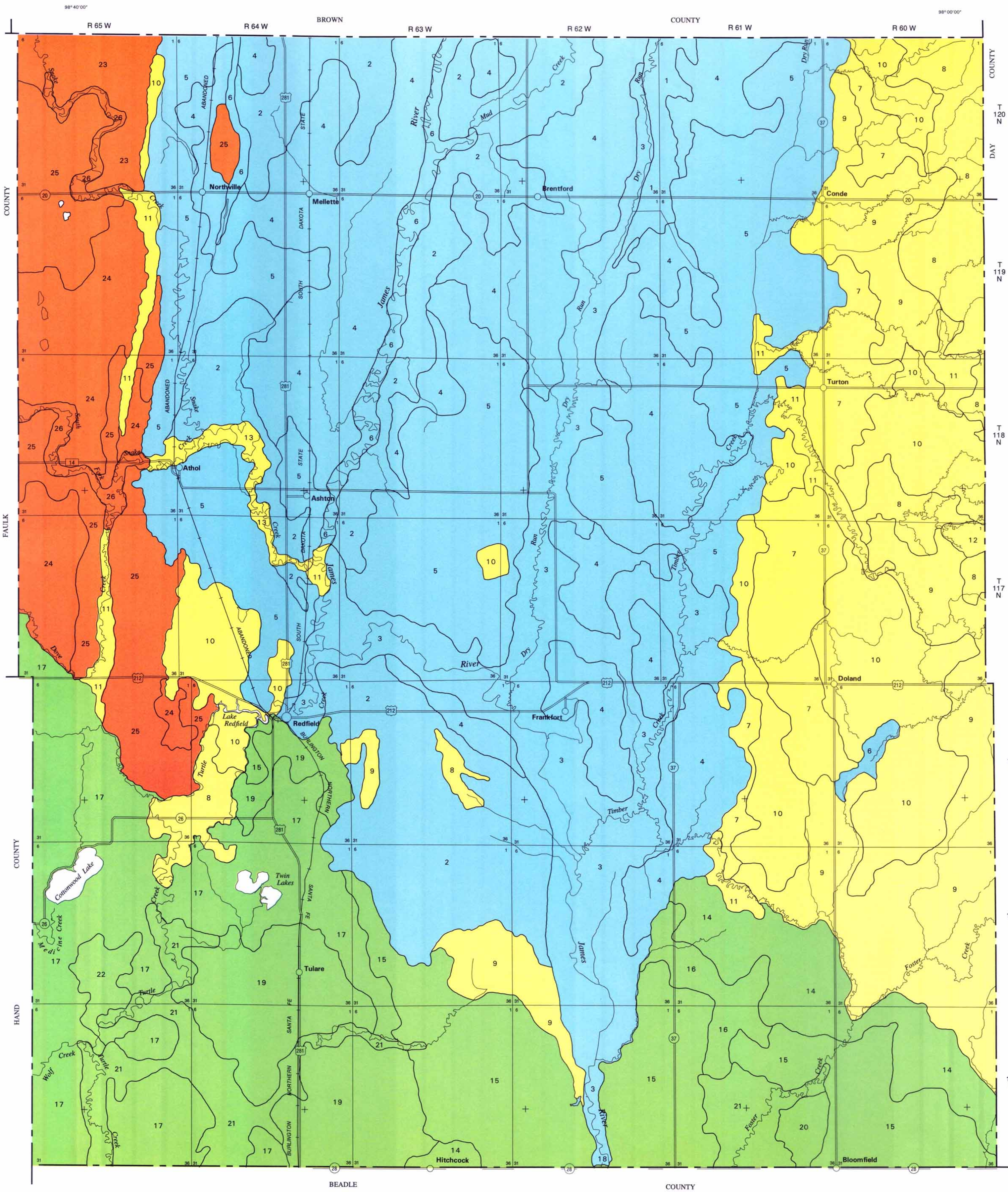
Soil name	Family or higher taxonomic class
Aastad-----	Fine-loamy, mixed, superactive, frigid Pachic Hapludolls
Aberdeen-----	Fine, smectitic, frigid Glossic Natrudolls
Aquents-----	Frigid Aquents
Arnegard-----	Fine-loamy, mixed, superactive, frigid Pachic Haplustolls
Barnes-----	Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
Beadle-----	Fine, smectitic, mesic Typic Argiustolls
Bearden-----	Fine-silty, mixed, superactive, frigid Aeris Calciaquolls
Beotia-----	Fine-silty, mixed, superactive, frigid Pachic Hapludolls
Betts-----	Fine-loamy, mixed, superactive, mesic Typic Calciustepts
Blendon-----	Coarse-loamy, mixed, superactive, mesic Pachic Haplustolls
Bon-----	Fine-loamy, mixed, superactive, mesic Cumulic Haplustolls
Bonilla-----	Fine-loamy, mixed, superactive, mesic Pachic Haplustolls
Bowbells-----	Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
Bowdle-----	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Pachic Haplustolls
Brookings-----	Fine-silty, mixed, superactive, frigid Aquic Hapludolls
Buse-----	Fine-loamy, mixed, superactive, frigid Typic Calciudolls
Camtown-----	Fine-silty, mixed, superactive, frigid Glossic Natrudolls
Carthage-----	Coarse-loamy, mixed, superactive, mesic Pachic Haplustolls
Cavour-----	Fine, smectitic, superactive, frigid Calcic Natrudolls
Colvin-----	Fine-silty, mixed, superactive, frigid Typic Calciaquolls
Cresbard-----	Fine, smectitic, frigid Glossic Natrudolls
Crossplain-----	Fine, smectitic, mesic Typic Argiaquolls
Davis-----	Fine-loamy, mixed, superactive, mesic Pachic Haplustolls
Davison-----	Fine-loamy, mixed, superactive, mesic Aeris Calciaquolls
Delmont-----	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Typic Haplustolls
Dimo-----	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Pachic Haplustolls
Doland-----	Fine-loamy, mixed, superactive, frigid Calcic Hapludolls
Dovecreek-----	Fine-silty, mixed, superactive, frigid Cumulic Haplustolls
Dovray-----	Fine, smectitic, frigid Cumulic Vertic Epiquolls
Dudley-----	Fine, smectitic, mesic Typic Natrustolls
Durrstein-----	Fine, smectitic, mesic Vertic Natraquolls
Eckman-----	Coarse-silty, mixed, superactive, frigid Calcic Hapludolls
Edgeley-----	Fine-loamy, mixed, superactive, frigid Typic Hapludolls
Egeland-----	Coarse-loamy, mixed, superactive, frigid Calcic Hapludolls
Els-----	Mixed, mesic Aquic Ustipsamments
Elsmere-----	Sandy, mixed, mesic Aquic Haplustolls
Embsen-----	Coarse-loamy, mixed, superactive, frigid Pachic Hapludolls
Enet-----	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Pachic Haplustolls
Ethan-----	Fine-loamy, mixed, superactive, mesic Typic Calciustolls
Exline-----	Fine, smectitic, frigid Leptic Natrudolls
Farmsworth-----	Fine, smectitic, mesic Vertic Natrustolls
Ferney-----	Fine, smectitic, frigid Leptic Natrudolls
Fordville-----	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Pachic Hapludolls
Forestburg-----	Sandy over loamy, mixed, superactive, mesic Entic Haplustolls
Forman-----	Fine-loamy, mixed, superactive, frigid Calcic Argiudolls
Gardena-----	Coarse-silty, mixed, superactive, frigid Pachic Hapludolls
Glyndon-----	Coarse-silty, mixed, superactive, frigid Aeris Calciaquolls
Grat-----	Clayey over sandy or sandy-skeletal, smectitic, mesic Typic Argiaquolls
Great Bend-----	Fine-silty, mixed, superactive, frigid Calcic Hapludolls
Hammerly-----	Fine-loamy, mixed, superactive, frigid Aeris Calciaquolls
Hand-----	Fine-loamy, mixed, superactive, mesic Typic Haplustolls
Harmony-----	Fine, smectitic, frigid Pachic Argiudolls
Harriet-----	Fine, smectitic, frigid Typic Natraquolls
Heil-----	Fine, smectitic, frigid Typic Natraquerts
Henkin-----	Coarse-loamy, mixed, superactive, mesic Udic Haplustolls
Holmquist-----	Coarse-loamy, mixed, superactive, calcareous, frigid Mollic Fluvaquents
Houdek-----	Fine-loamy, mixed, superactive, mesic Typic Argiustolls
Hoven-----	Fine, smectitic, mesic Vertic Natraquolls

Classification of the Soils--Continued

Soil name	Family or higher taxonomic class
Huffton-----	Coarse-silty, mixed, superactive, frigid Typic Calciudolls
Ipaga-----	Mixed, mesic Oxyaquic Ustipsamments
Jerauld-----	Fine, smectitic, mesic Leptic Natrustolls
Kranzburg-----	Fine-silty, mixed, superactive, frigid Calcic Hapludolls
La Prairie-----	Fine-loamy, mixed, superactive, frigid Cumulic Hapludolls
LaDelle-----	Fine-silty, mixed, superactive, frigid Cumulic Hapludolls
Lamo-----	Fine-silty, mixed, superactive, calcareous, mesic Cumulic Endoaquolls
Lamoure-----	Fine-silty, mixed, superactive, calcareous, frigid Cumulic Endoaquolls
Langhei-----	Fine-loamy, mixed, superactive, frigid Typic Eutrudepts
Lawet-----	Fine-loamy, mixed, superactive, mesic Typic Calciaquolls
Lehr-----	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Typic Haplustolls
Lowe-----	Fine-loamy, mixed, superactive, frigid Typic Calciaquolls
Ludden-----	Fine, smectitic, frigid Typic Endoaquerts
Maddock-----	Sandy, mixed, frigid Entic Hapludolls
Max-----	Fine-loamy, mixed, superactive, frigid Typic Haplustolls
Miranda-----	Fine, smectitic, frigid Leptic Natrustolls
Moritz-----	Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls
Nahon-----	Fine, smectitic, frigid Calcic Natrudolls
Niobell-----	Fine, smectitic, frigid Glossic Natrustolls
Noonan-----	Fine, smectitic, frigid Typic Natrustolls
Northville-----	Fine, smectitic, mesic Glossic Natrustolls
Overshue-----	Coarse-loamy, mixed, superactive, mesic Typic Endoaquolls
Parnell-----	Fine, smectitic, frigid Vertic Argiaquolls
Parshall-----	Coarse-loamy, mixed, superactive, frigid Pachic Haplustolls
Peever-----	Fine, smectitic, frigid Vertic Argiudolls
Pits-----	Orthents
Playmoor-----	Fine-silty, mixed, superactive, calcareous, frigid Cumulic Endoaquolls
Prosper-----	Fine-loamy, mixed, superactive, mesic Pachic Argiustolls
Putney-----	Fine-silty, mixed, superactive, frigid Calcic Hapludolls
Ranslo-----	Fine, smectitic, frigid Typic Natraqolls
Renshaw-----	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Calcic Hapludolls
Rimlap-----	Fine, smectitic, frigid Vertic Argialbolls
Rondell-----	Fine-silty, mixed, superactive, frigid Aquic Calciudolls
Shue-----	Sandy over loamy, mixed, superactive, mesic Typic Endoaquolls
Southam-----	Fine, smectitic, calcareous, frigid Cumulic Vertic Endoaquolls
Stickney-----	Fine, smectitic, mesic Glossic Natrustolls
Straw-----	Fine-loamy, mixed, superactive, frigid Cumulic Haplustolls
Talmo-----	Sandy-skeletal, mixed, mesic Udorthentic Haplustolls
Tetonka-----	Fine, smectitic, mesic Argiaquic Argialbolls
Toko-----	Fine-loamy, mixed, superactive, mesic Argiaquic Argialbolls
Tonka-----	Fine, smectitic, frigid Argiaquic Argialbolls
Turton-----	Fine-silty, mixed, superactive, frigid Calcic Natrudolls
Udorthents-----	Loamy Udorthents
Vallars-----	Fine-loamy, mixed, superactive, frigid Typic Calciaquolls
Vang-----	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Pachic Hapludolls
Vida-----	Fine-loamy, mixed, superactive, frigid Typic Argiustolls
Whitelake-----	Fine-loamy, mixed, superactive, mesic Typic Natrustolls
Williams-----	Fine-loamy, mixed, superactive, frigid Typic Argiustolls
Winship-----	Fine-silty, mixed, superactive, frigid Pachic Argiudolls
Woonsocket-----	Fine-loamy, mixed, superactive, mesic Glossic Natrustolls
Worthing-----	Fine, smectitic, mesic Vertic Argiaquolls
Zahill-----	Fine-loamy, mixed, superactive, frigid Typic Calciustepts
Zahl-----	Fine-loamy, mixed, superactive, frigid Typic Calciustolls
Zell-----	Coarse-silty, mixed, superactive, frigid Typic Calciudolls

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SOIL LEGEND*

LEVEL TO MODERATELY SLOPING, SILTY AND LOAMY SOILS
ON MOIST** COOL** LAKE PLAINS AND SILTY AND CLAYEY
SOILS ON FLOOD PLAINS MLRA-55B**

- 1 Gardena-Eckman Association
- 2 Great Bend-Beotia Association
- 3 Great Bend-Beotia-LaDelle Association
- 4 Aberdeen-Harmony-Nahon Association
- 5 Nahon-Aberdeen-Exline Association
- 6 Ludden-Lamoure Association
- 7 Kranzburg-Cresbard-Brookings Association
- 8 Forman-Aastad Association
- 9 Forman-Cresbard-Cavour Association
- 10 Cresbard-Cavour-Ferney Association
- 11 Ranslo-Harriet Association
- 12 La Prairie-Playmoor-Lowe Association

- 13 LaDelle-Ludden Association

NEARLY LEVEL TO STEEP, LOAMY, SILTY, AND SANDY SOILS
ON DRY** WARM** TILL PLAINS, OUTWASH PLAINS, AND
FLOOD PLAINS MLRA-55C**

- 14 Houdek-Stickney-Dudley Association
- 15 Beadle-Stickney-Dudley Association
- 16 Stickney-Dudley-Hoven Association
- 17 Hand-Ethan-Bonilla Association
- 18 Betts-Lamo Association
- 19 Hand-Carthage-Forestburg Association
- 20 Dimeo-Grat Association
- 21 Northville-Farmsworth-Durrstein Association
- 22 Delmont-Enet Association
- 23 Williams-Bowbells Association
- 24 Williams-Niobell-Noonan Association

- 25 Max-Arnegard-Zahl Association

- 26 Dovecreek-Staw Association

* The units on this legend are described in the text
under the heading "General Soil Map Units"
** See "Formation of Soils (Climate)"

SECTIONALIZED
TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

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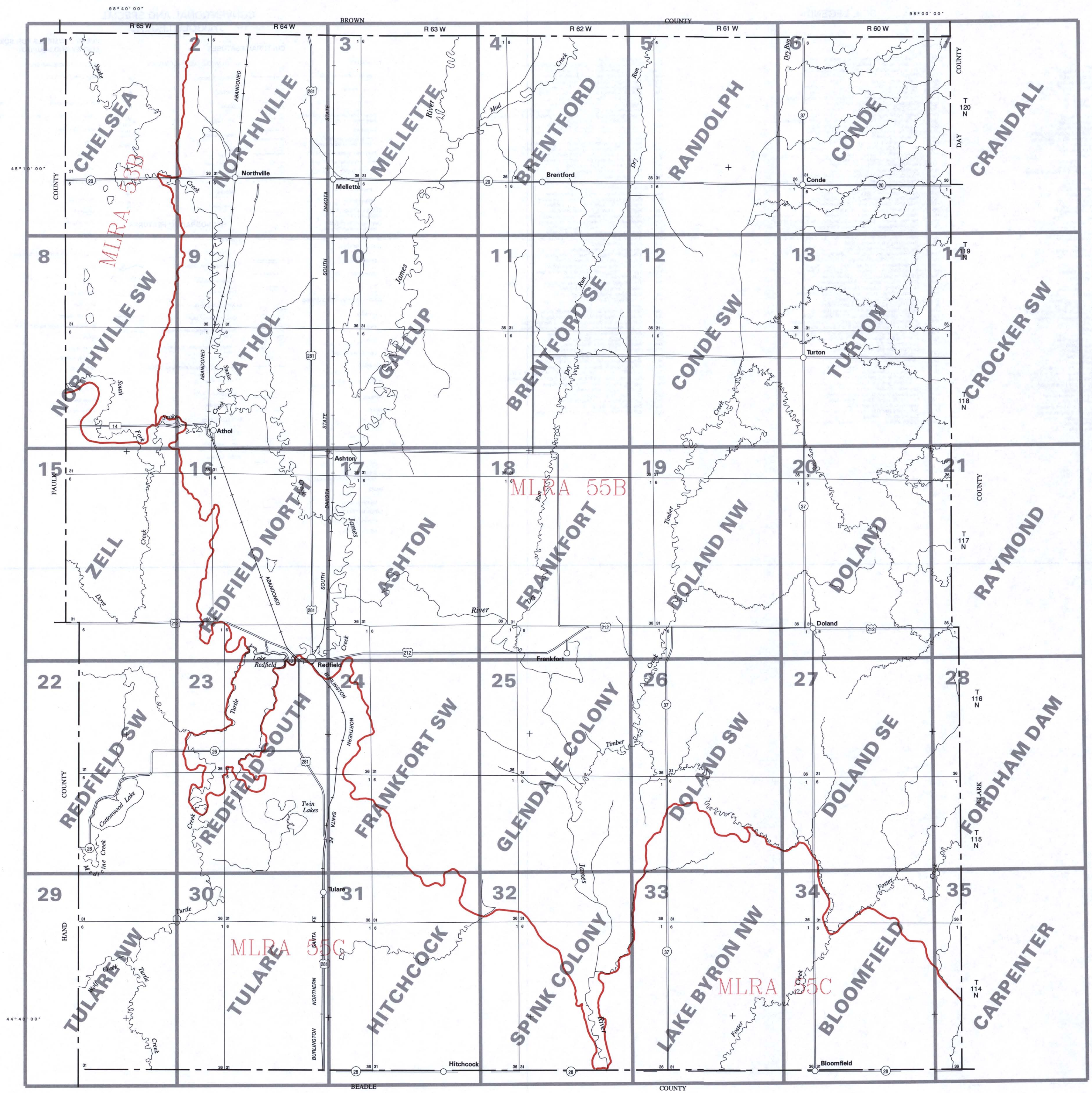
UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
in cooperation with
UNITED STATES DEPARTMENT OF INTERIOR
BUREAU OF INDIAN AFFAIRS
and the
SOUTH DAKOTA AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP
SPINK COUNTY, SOUTH DAKOTA

1 0 1 2 3
MILES

1 0 1 2 3 4 5 6
KILOMETERS

SCALE = 1:150000

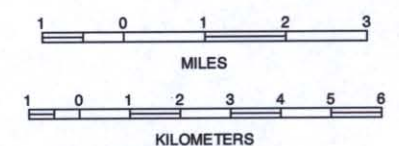


SECTIONALIZED
TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36



INDEX TO MAP SHEETS
SPINK COUNTY, SOUTH DAKOTA



SOIL LEGEND

SYMBOL	NAME	SYMBOL	NAME
Aa	Aastad loam, 0 to 2 percent slopes	FrB	Forman-Buse-Aastad loams, 1 to 6 percent slopes
Ab	Aastad-Hamerly loams, 0 to 2 percent slopes	FrC	Forman-Buse-Aastad loams, 2 to 9 percent slopes
Ad	Aastad-Tonka complex, 0 to 2 percent slopes	FsA	Forman-Cresbard loams, 0 to 2 percent slopes
Ae	Aberdeen-Nahon silt loams, till substratum, 0 to 2 percent slopes	FsB	Forman-Cresbard loams, 2 to 6 percent slopes
Ah	Aberdeen-Nahon silty clay loams, 0 to 2 percent slopes	FtA	Forman-Cresbard-Tonka complex, 0 to 2 percent slopes
An	Aberdeen-Nahon-Heil silt loams, 0 to 2 percent slopes	Ga	Gardena very fine sandy loam, 0 to 2 percent slopes
Ao	Aberdeen-Nahon-Heil silt loams, till substratum, 0 to 2 percent slopes	Gd	Gardena-Glyndon silt loams, 0 to 2 percent slopes
At	Aquents, loamy, 0 to 2 percent slopes	Ge	Gardena-Turton very fine sandy loams, 0 to 2 percent slopes
BaC	Beadle loam, 6 to 9 percent slopes	GgA	Great Bend silt loam, 0 to 2 percent slopes
BdA	Beadle-Dudley complex, 0 to 2 percent slopes	GnA	Great Bend-Beotia silt loams, 0 to 2 percent slopes
BeA	Beadle-Stickney complex, 0 to 2 percent slopes	GnB	Great Bend-Beotia silt loams, 1 to 6 percent slopes
BeB	Beadle-Stickney complex, 1 to 6 percent slopes	GoA	Great Bend-Beotia silt loams, till substratum, 0 to 2 percent slopes
BfA	Beadle-Stickney complex, 0 to 2 percent slopes, very stony	GpA	Great Bend-Putney silt loams, 0 to 2 percent slopes
BfB	Beadle-Stickney complex, 1 to 6 percent slopes, very stony	GpB	Great Bend-Putney silt loams, 2 to 4 percent slopes
Bg	Bearden silt loam, 0 to 2 percent slopes	GiB	Great Bend-Zell silt loams, 2 to 6 percent slopes
Bk	Bearden-Tonka silt loams, 0 to 2 percent slopes	GiC	Great Bend-Zell silt loams, 4 to 9 percent slopes
Bo	Beotia silt loam, 0 to 2 percent slopes	GzC	Great Bend-Zell-Huffton silt loams, 4 to 9 percent slopes
Br	Beotia-Rondell silt loams, 0 to 3 percent slopes	HaA	Hamerly loam, 0 to 2 percent slopes
Bs	Beotia-Winship silt loams, 0 to 2 percent slopes	Hb	Hamerly-Tonka complex, 0 to 2 percent slopes
Bt	Beotia-Winship silt loams, till substratum, 0 to 2 percent slopes	HcA	Hand-Bonilla loams, 0 to 3 percent slopes
Bu	Bon loam, 0 to 2 percent slopes	HcB	Hand-Bonilla loams, 1 to 6 percent slopes
Bw	Bon loam, channeled	HcD	Hand-Carthage fine sandy loams, 0 to 3 percent slopes
BxD	Buse-Barnes loams, 9 to 20 percent slopes	He	Hand-Carthage-Overshue fine sandy loams, 0 to 3 percent slopes
ByE	Buse-Barnes loams, 9 to 40 percent slopes, very stony	HfC	Hand-Ethan loams, 6 to 9 percent slopes
BzE	Buse-Langhei complex, 15 to 40 percent slopes	HgB	Hand-Ethan-Bonilla loams, 1 to 6 percent slopes
Ca	Camtown-Turton loams, 0 to 2 percent slopes	HgC	Hand-Ethan-Bonilla loams, 2 to 9 percent slopes
Cc	Cavour-Ferney loams, 0 to 2 percent slopes	HnB	Hand-Ethan-Carthage complex, 1 to 6 percent slopes
Co	Colvin silty clay loam, saline, 0 to 1 percent slopes	HjB	Hand-Talmo complex, 2 to 6 percent slopes
Cr	Cresbard-Cavour loams, 0 to 2 percent slopes	HjC	Hand-Talmo complex, 6 to 9 percent slopes
Cs	Cresbard-Cavour-Heil complex, 0 to 2 percent slopes	Hk	Harmony-Aberdeen silt loams, till substratum, 0 to 2 percent slopes
Ct	Crossplain-Tetonka complex, 0 to 1 percent slopes	Hm	Harmony-Aberdeen silty clay loams, 0 to 2 percent slopes
Da	Davis-Northville complex, 0 to 2 percent slopes	Hn	Harmony-Beotia silt loams, 0 to 2 percent slopes
Db	Davison loam, 0 to 2 percent slopes	Ho	Harmony-Beotia silt loams, till substratum, 0 to 2 percent slopes
Dd	Davison-Tetonka complex, 0 to 2 percent slopes	Hp	Harriet loam, 0 to 1 percent slopes
DeA	Delmont-Enet loams, 0 to 2 percent slopes	Hr	Heil silt loam, 0 to 1 percent slopes
Dk	Dimo loam, 0 to 2 percent slopes	Has	Henkin-Blendon fine sandy loams, 0 to 2 percent slopes
Dm	Dimo-Grat loams, 0 to 2 percent slopes	HsB	Henkin-Blendon fine sandy loams, 2 to 6 percent slopes
DoA	Doland-Embden complex, 0 to 3 percent slopes	HtB	Houdek-Ethan-Prosper loams, 1 to 6 percent slopes
Dq	Dovecreek silt loam, 0 to 2 percent slopes	HtC	Houdek-Ethan-Prosper loams, 2 to 9 percent slopes
Dr	Dovray silty clay, 0 to 1 percent slopes	HuA	Houdek-Prosper loams, 0 to 2 percent slopes
Du	Dudley-Jerauld silt loams, 0 to 2 percent slopes	HuB	Houdek-Prosper loams, 1 to 6 percent slopes
Dx	Durrstein silt loam, 0 to 1 percent slopes	HxA	Houdek-Stickney-Tetonka complex, 0 to 2 percent slopes
Ea	Eckman very fine sandy loam, 0 to 2 percent slopes	Hx	Hoven silt loam, 0 to 1 percent slopes
EcA	Eckman-Gardena very fine sandy loams, 0 to 2 percent slopes	Hy	Ipaga-Els-Shue complex, 0 to 6 percent slopes
EcB	Eckman-Gardena very fine sandy loams, 2 to 6 percent slopes	Ia	Jerauld-Hoven silt loams, 0 to 2 percent slopes
EdB	Eckman-Zell very fine sandy loams, 2 to 6 percent slopes	Jh	Kranzburg-Brookings silt loams, 0 to 2 percent slopes
EeB	Edgeley loam, 2 to 6 percent slopes	KaA	Kranzburg-Brookings-Buse complex, 1 to 6 percent slopes
EeC	Edgeley loam, 6 to 9 percent slopes	KbB	Kranzburg-Cresbard silt loams, 0 to 2 percent slopes
EeD	Edgeley loam, 9 to 20 percent slopes	KcA	Kranzburg-Cresbard-Tonka silt loams, 0 to 2 percent slopes
EgA	Egeland-Embden complex, 0 to 2 percent slopes	KtA	Kranzburg-Cresbard-Tonka silt loams, 0 to 2 percent slopes
EgB	Egeland-Embden complex, 2 to 6 percent slopes	KzB	Kranzburg-Zell-Aastad complex, 1 to 6 percent slopes
EK	Elsmere loamy sand, 0 to 2 percent slopes	La	La Prairie loam, 0 to 2 percent slopes
ErtE	Ethan-Betts loams, 15 to 40 percent slopes	Lc	La Prairie-Holmquist loams, channeled
ErD	Ethan-Hand loams, 9 to 20 percent slopes	Ld	LaDelle silt loam, 0 to 2 percent slopes
Er	Exline-Aberdeen-Nahon silt loams, 0 to 2 percent slopes	Le	LaDelle silt loam, channeled
Et	Exline-Aberdeen-Nahon silt loams, till substratum, 0 to 2 percent slopes	Lk	Lamo silty clay loam, 0 to 1 percent slopes
Ew	Exline-Heil silt loams, 0 to 2 percent slopes	Lm	Lamoure silty clay loam, 0 to 1 percent slopes
Ex	Exline-Heil silt loams, till substratum, 0 to 2 percent slopes	Ln	Lawet loam, 0 to 2 percent slopes
EyA	Exline-Putney silt loams, 1 to 4 percent slopes	Lo	Lawet loam, wet, 0 to 1 percent slopes
Fa	Farmsworth-Durrstein silt loams, 0 to 2 percent slopes	Lp	Lawet-Davison loams, 0 to 2 percent slopes
Fe	Ferney-Heil complex, 0 to 2 percent slopes	LrA	Lehr-Bowdle loams, 0 to 3 percent slopes
Fi	Forestburg-Elsmere loamy sands, 0 to 2 percent slopes	LrB	Lehr-Bowdle loams, 3 to 6 percent slopes
Fh	Forestburg-Elsmere-Toko complex, 0 to 2 percent slopes	Ls	Lowe loam, 0 to 1 percent slopes
FmA	Forman-Aastad loams, 0 to 3 percent slopes	Lt	Ludden silty clay, 0 to 1 percent slopes
FmB	Forman-Aastad loams, 1 to 6 percent slopes	Lu	Ludden silty clay, ponded
FrC	Forman-Buse loams, 6 to 9 percent slopes	Lw	Ludden silty clay, wet, 0 to 1 percent slopes

SYMBOL	NAME
M-W	Miscellaneous Water
MdA	Maddock-Egeland sandy loams, 6 to 9 percent slopes
MdA	Max-Arnegard loams, 0 to 3 percent slopes
MdB	Max-Arnegard loams, 1 to 3 percent slopes
MgB	Max-Arnegard-Zahl loams, 1 to 6 percent slopes
MnB	Max-Niobell-Noonan loams, 2 to 6 percent slopes
MxC	Max-Zahl-Arnegard loams, 2 to 9 percent slopes
My	Miranda-Heil complex, 0 to 2 percent slopes
Mz	Moritz-Lowe loams, 0 to 2 percent slopes
Na	Nahon-Aberdeen-Exline silt loams, 0 to 2 percent slopes
Nb	Nahon-Aberdeen-Exline silt loams, till substratum, 0 to 2 percent slopes
Nc	Niobell-Noonan loams, 0 to 2 percent slopes
Nd	Niobell-Noonan-Heil complex, 0 to 2 percent slopes
NeA	Niobell-Noonan-Max loams, 0 to 3 percent slopes
Nm	Noonan-Miranda loams, 0 to 2 percent slopes
Nr	Northville-Farmsworth silt loams, 0 to 2 percent slopes
Nv	Northville-Farmsworth-Hoven silt loams, 0 to 2 percent slopes
Ov	Overshue fine sandy loam, 0 to 1 percent slopes
Pa	Parnell silty clay loam, 0 to 1 percent slopes
Pc	Parshall loam, 0 to 3 percent slopes
PeA	Peever clay loam, 0 to 2 percent slopes
PgB	Peever-Buse clay loams, 1 to 4 percent slopes
PoA	Peever-Cavour complex, 0 to 2 percent slopes
Pp	Pits, gravel and sand
Pr	Playmoor silty clay loam, 0 to 1 percent slopes
Py	Playmoor-Lamoure silty clay loams, channeled
Ra	Ranslo silty clay loam, 0 to 1 percent slopes
Re	Ranslo-Harriet loams, 0 to 2 percent slopes
RIA	Renshaw-Fordville loams, 0 to 2 percent slopes
RfB	Renshaw-Fordville loams, 2 to 6 percent slopes
So	Southam silty clay loam, 0 to 1 percent slopes
St	Stickney-Dudley silt loams, 0 to 2 percent slopes
Su	Stickney-Dudley-Hoven silt loams, 0 to 2 percent slopes
S w	Straw loam, channeled
Sx	Straw loam, 0 to 2 percent slopes
TbE	Talmo-Ethan complex, 9 to 40 percent slopes, very stony
Te	Tetonka silt loam, 0 to 1 percent slopes
Tk	Toko fine sandy loam, 0 to 1 percent slopes
Tm	Toko fine sandy loam, wet, 0 to 1 percent slopes
Tn	Tonka silt loam, 0 to 1 percent slopes
To	Tonka-Rimlap silt loams, 0 to 1 percent slopes
Us	Udorthents silty, 0 to 2 percent slopes
Va	Valliers-Hamerly loams, 0 to 2 percent slopes
VgA	Vang loam, 0 to 2 percent slopes
W	Water
WaA	Williams-Bowbells loams, 0 to 3 percent slopes
WaB	Williams-Bowbells loams, 1 to 6 percent slopes
WbA	Williams-Bowbells-Tonka complex, 0 to 3 percent slopes
WbB	Williams-Bowbells-Tonka complex, 0 to 6 percent slopes
WcA	Williams-Niobell loams, 0 to 3 percent slopes
WcB	Williams-Niobell loams, 3 to 6 percent slopes
WdA	Williams-Niobell-Tonka complex, 0 to 3 percent slopes
WdD	Williams-Vida loams, 6 to 15 percent slopes
WmB	Williams-Zahl-Bowbells loams, 1 to 6 percent slopes
WmC	Williams-Zahl-Bowbells loams, 2 to 9 percent slopes
Wn	Winship-Tonka silt loams, 0 to 1 percent slopes
Wo	Winship-Tonka silt loams, till substratum, 0 to 1 percent slopes
Ws	Woonsocket-Whitelake fine sandy loams, 0 to 2 percent slopes
Wt	Worthing silty clay loam, 0 to 1 percent slopes
W w	Worthing silty clay loam, ponded
ZaE	Zahill loam, 15 to 40 percent slopes
ZbC	Zahl-Max loams, 6 to 9 percent slopes
ZbD	Zahl-Max loams, 9 to 20 percent slopes
ZgD	Zell-Great Bend silt loams, 6 to 25 percent slopes

CONVENTIONAL AND SPECIAL
SYMBOLS LEGEND

CULTURAL FEATURES		SPECIAL SYMBOLS FOR SOIL SURVEY AND SSURGO	
BOUNDARIES	MISCELLANEOUS CULTURAL FEATURES	SOIL DELINEATIONS AND SYMBOLS	
National, state, or province	Farmstead, house	LANDFORM FEATURES	
County or parish	Church	Bedrock escarpment	
Minor civil division	School	Other than bedrock escarpment	
Reservation (national forest or park, state forest or park)	Other Religion	Short steep slope	
Land grant	Located object	Gully	
Limit of soil survey (label) and/or denied access area	Tank	Depression, closed	
Field sheet matchline and neatline	Lookout Tower	Sinkhole	
Previously Published Survey	Oil and/or Natural Gas Wells	EXCAVATIONS	
OTHER BOUNDARY (label)	Windmill	Borrow pits	
Airport, airfield	Lighthouse	Gravel pit	
Cemetery		Mine or quarry	
City/county park		Landfill	
STATE COORDINATE TICK 1 890 000 FEET			
LAND DIVISION CORNER (section and land grants)			
GEOGRAPHIC COORDINATE TICK			
TRANSPORTATION	STREAMS	MISCELLANEOUS SURFACE FEATURES	
Divided roads	Perennial stream, double line	Blowout	
Other roads	Perennial stream, single line	Clay spot	
Trail	Intermittent stream	Gravelly spot	
	Drainage end	Lava flow	
ROAD EMBLEM AND DESIGNATIONS	DRAINAGE AND IRRIGATION	Marsh or swamp	
Interstate	Double-line canal (label)	Rock outcrop (includes sandstone and shale)	
Federal	Perennial drainage and/or irrigation ditch	Saline spot	
State	Intermittent drainage and/or irrigation ditch	Sandy spot	
County, farm or ranch		Severely eroded spot	
RAILROAD	SMALL LAKES, PONDS AND RESERVOIRS	Slide or slip	
POWER TRANSMISSION LINE	Perennial water	Sodic spot	
PIPELINE	Miscellaneous water	Spoil area	
FENCE	Flood pool line	Stony spot	
LEVEES	MISCELLANEOUS WATER FEATURES	Very stony spot	
Without road	Spring	Wet spot	
With road	Well, artesian		
With railroad	Well, irrigation		
Single side slope (showing actual feature location)			
DAMS			
Medium or Small			
LANDFORM FEATURES			
Prominent hill or peak			
Soil Sample Site			

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

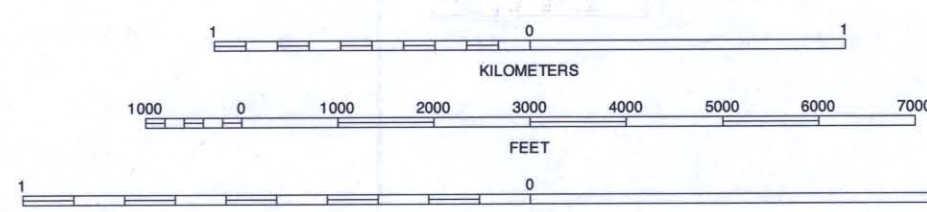
SPINK COUNTY, SOUTH DAKOTA
CHELSEA QUADRANGLE
SHEET NUMBER 1 OF 35



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1984 aerial photography.

North American Datum of 1927 (NAD27), Clarke 1866 Spheroid 1000-meter ticks. Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

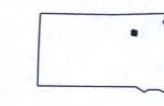
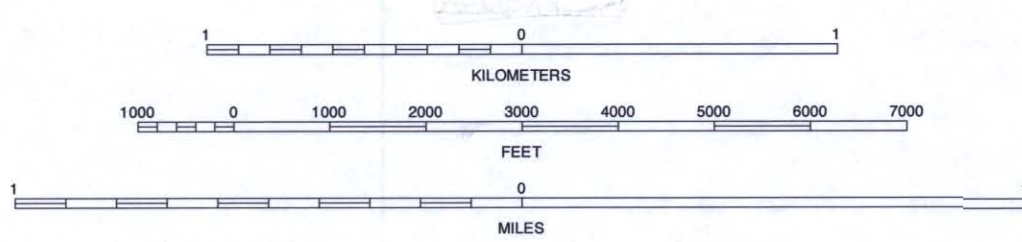


CHELSEA, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 1 OF 35



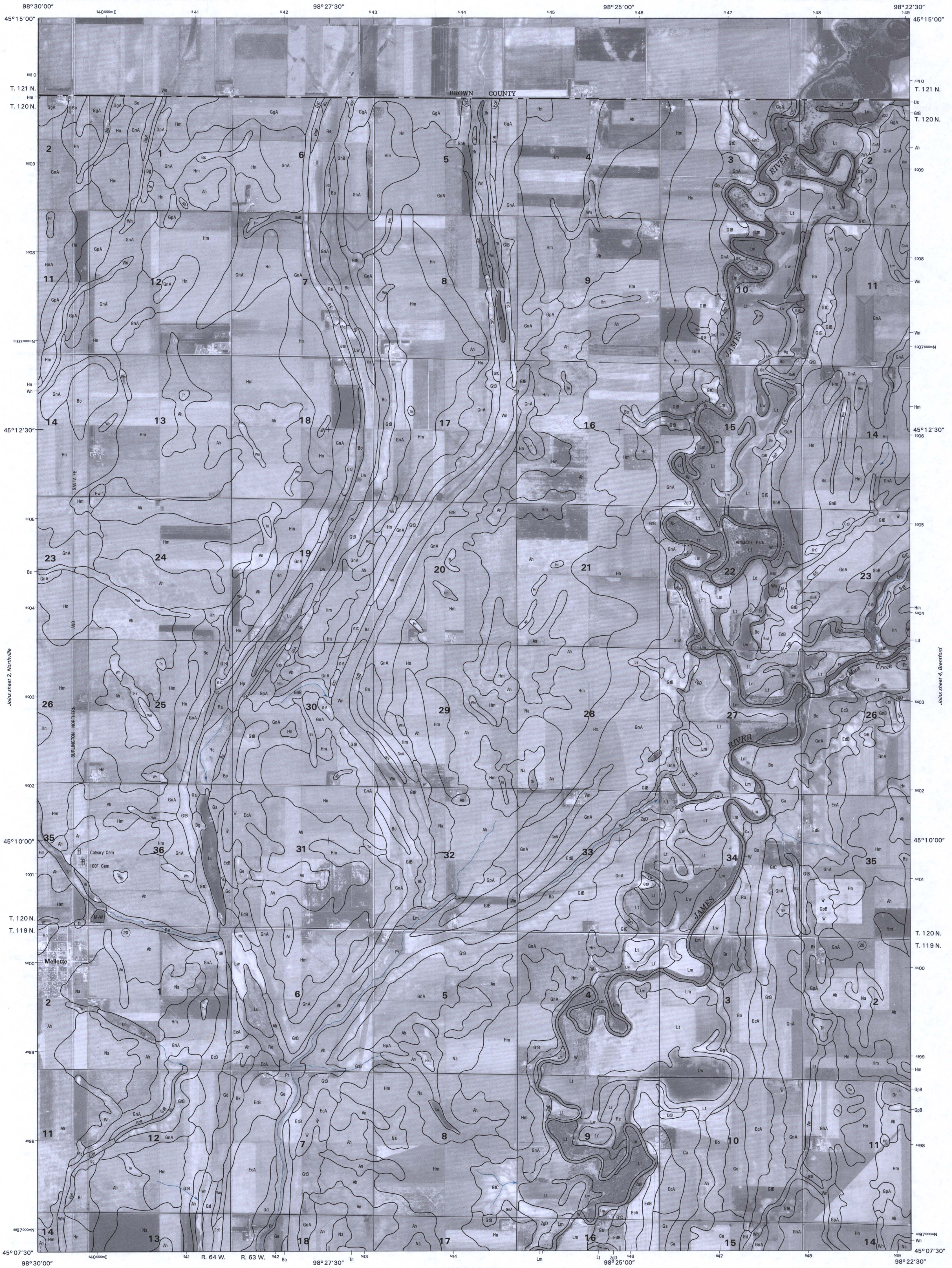
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NORTHVILLE, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 2 OF 35

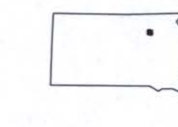
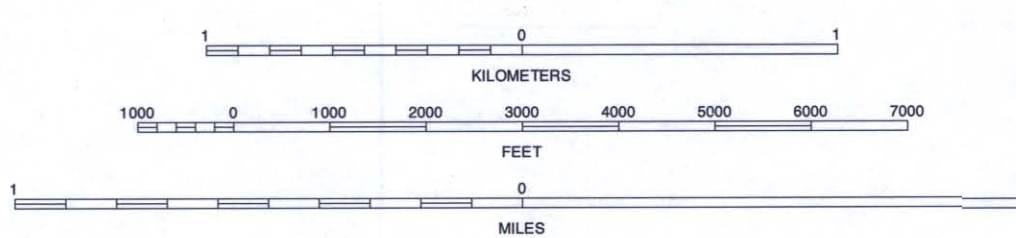
QUADRANGLE LOCATION



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1000-meter ticks: Universal Transverse Mercator, zone 14.
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NORTH



QUADRANGLE LOCATION

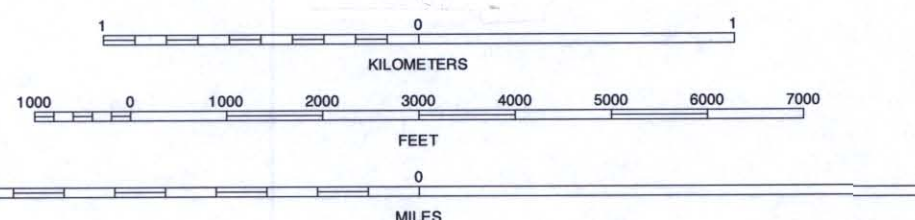
MELLETT, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 3 OF 35



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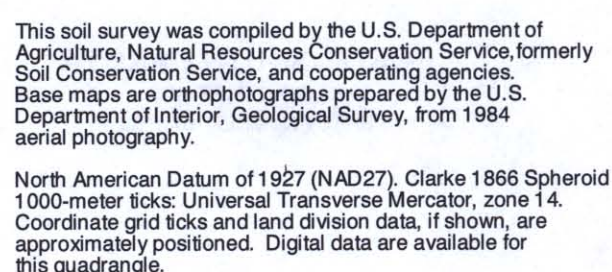
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NORTH



BRENTFORD, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 4 OF 35

SPINK COUNTY, SOUTH DAKOTA
RANDOLPH QUADRANGLE
SHEET NUMBER 5 OF 35



SPINK COUNTY, SOUTH DAKOTA
CONDE QUADRANGLE
SHEET NUMBER 6 OF 35

98°07'30" 98°05'00" 98°02'30" 98°00'00"



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NATURAL RESOURCES CONSERVATION SERVICE

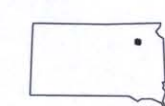
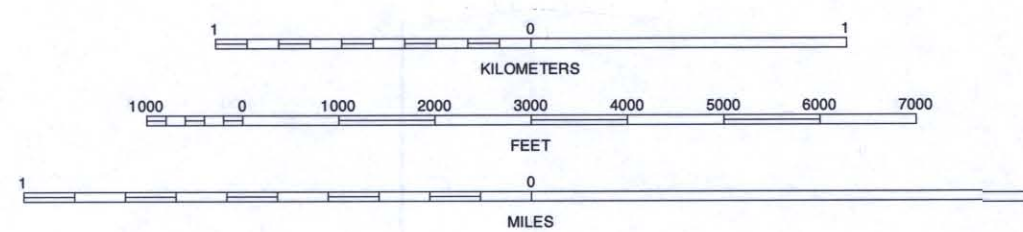
SPINK COUNTY, SOUTH DAKOTA
CRANDALL QUADRANGLE
SHEET NUMBER 7 OF 35



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North American Datum of 1927 (NAD27), Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION

CRANDALL, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 7 OF 35

SPINK COUNTY, SOUTH DAKOTA
NORTHVILLE SW QUADRANGLE
SHEET NUMBER 8 OF 35



NORTHVILLE SW, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 8 OF 35

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

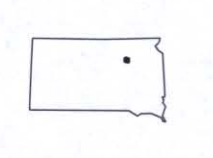
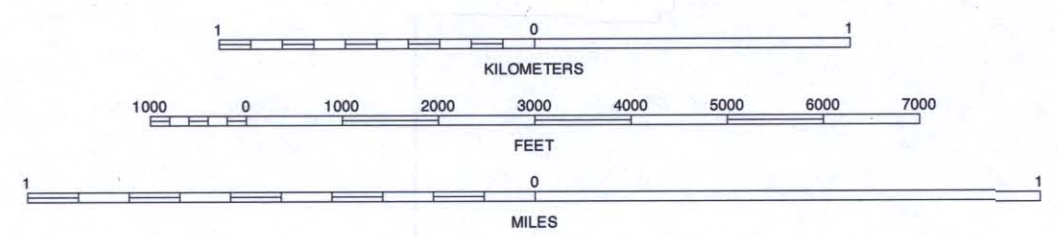
SPINK COUNTY, SOUTH DAKOTA
ATHOL QUADRANGLE
SHEET NUMBER 9 OF 35



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1984 aerial photography.

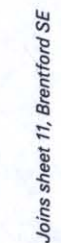
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1000-meter ticks: Universal Transverse Mercator, zone 14.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



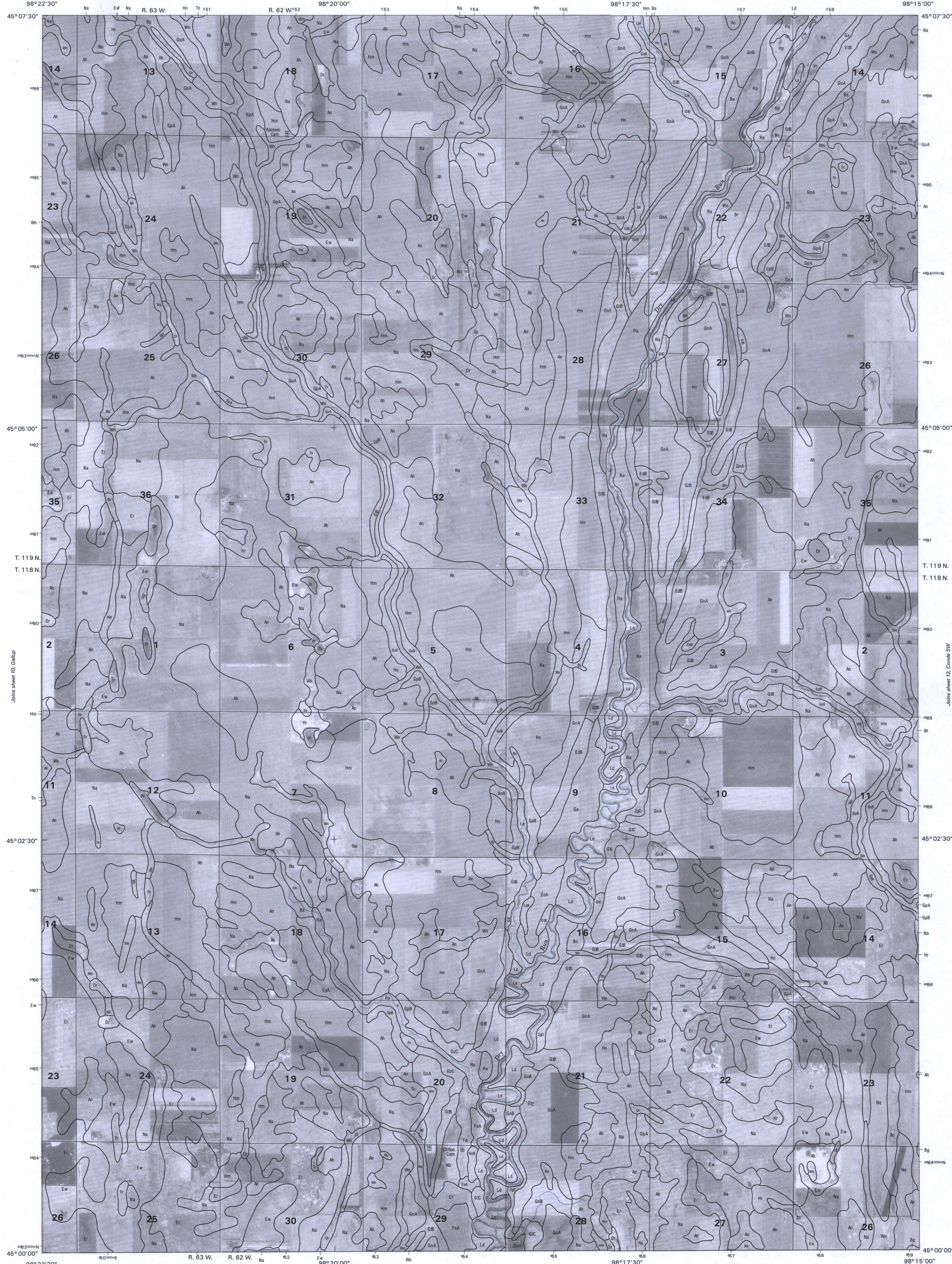
ATHOL, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 9 OF 35

QUADRANGLE LOCATION



QUADRANGLE LOCATION

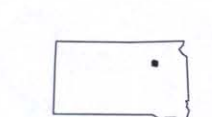
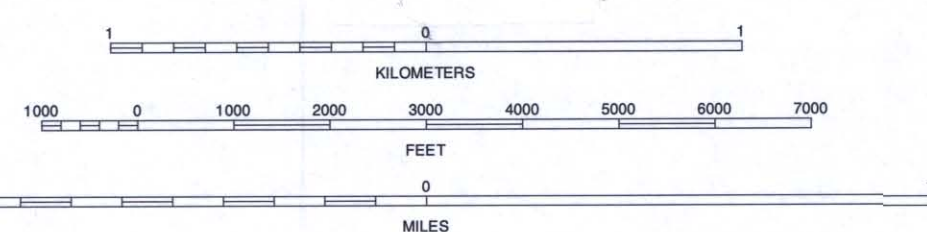
GALLUP, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 10 OF 35



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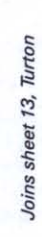
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NORTH

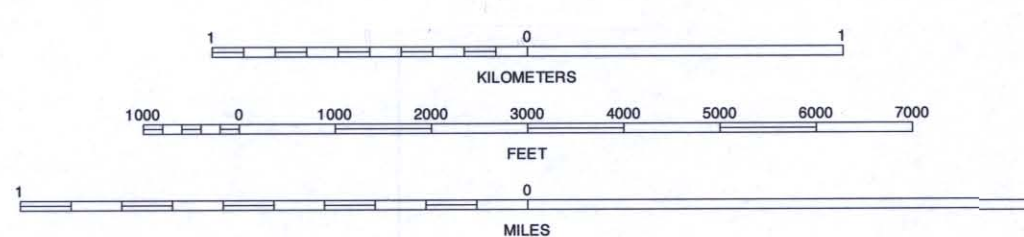


QUADRANGLE LOCATION

BRENTFORD SE, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 11 OF 35



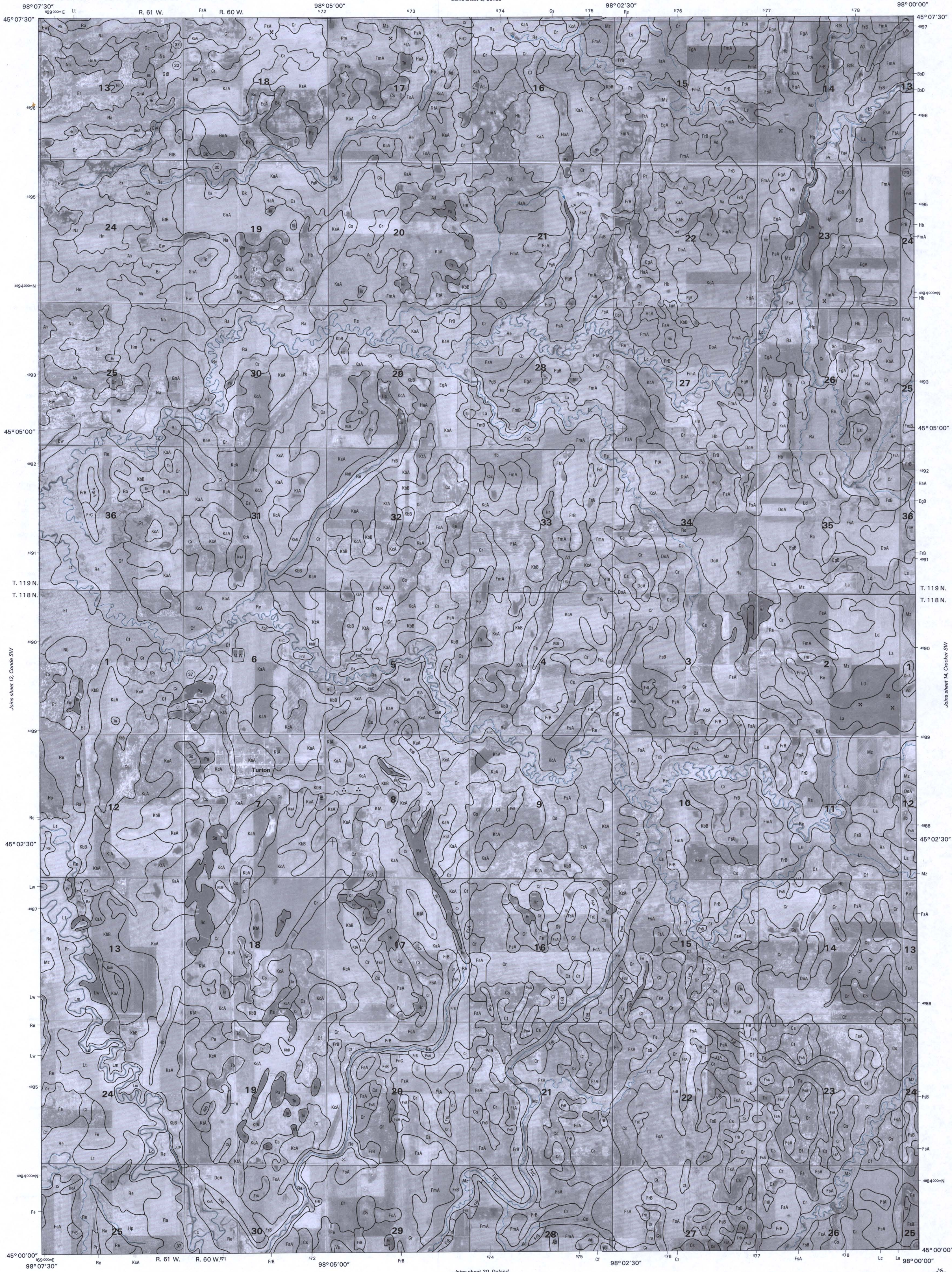
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1000-meter ticks: Universal Transverse Mercator, zone 14.
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QUADRANGLE LOCATION

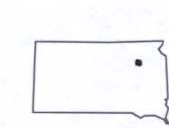
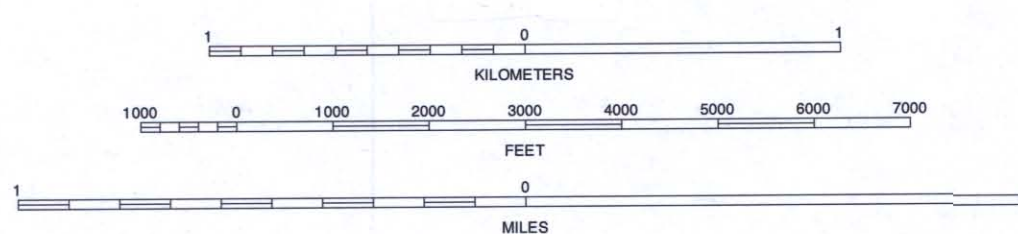
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DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SPINK COUNTY, SOUTH DAKOTA
TURTON QUADRANGLE
SHEET NUMBER 13 OF 35



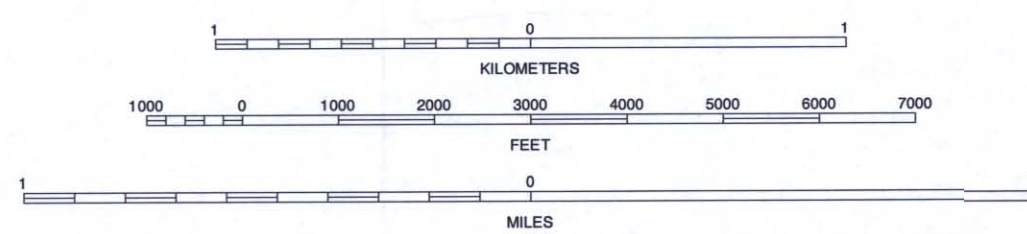
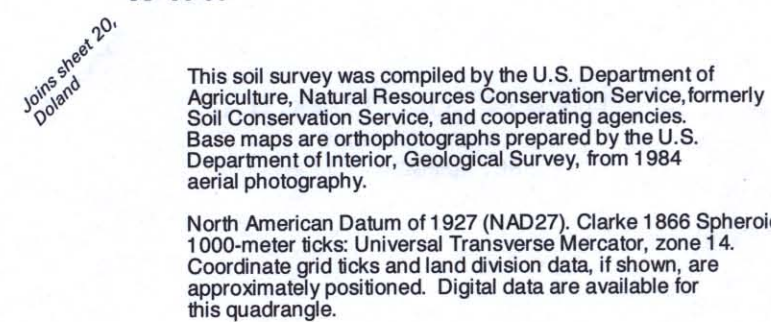
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North American Datum of 1927 (NAD27), Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUADRANGLE LOCATION

TURTON, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 13 OF 35



CROCKER SW, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 14 OF 35



QUADRANGLE LOCATION

SPINK COUNTY, SOUTH DAKOTA
ZELL QUADRANGLE
SHEET NUMBER 15 OF 35

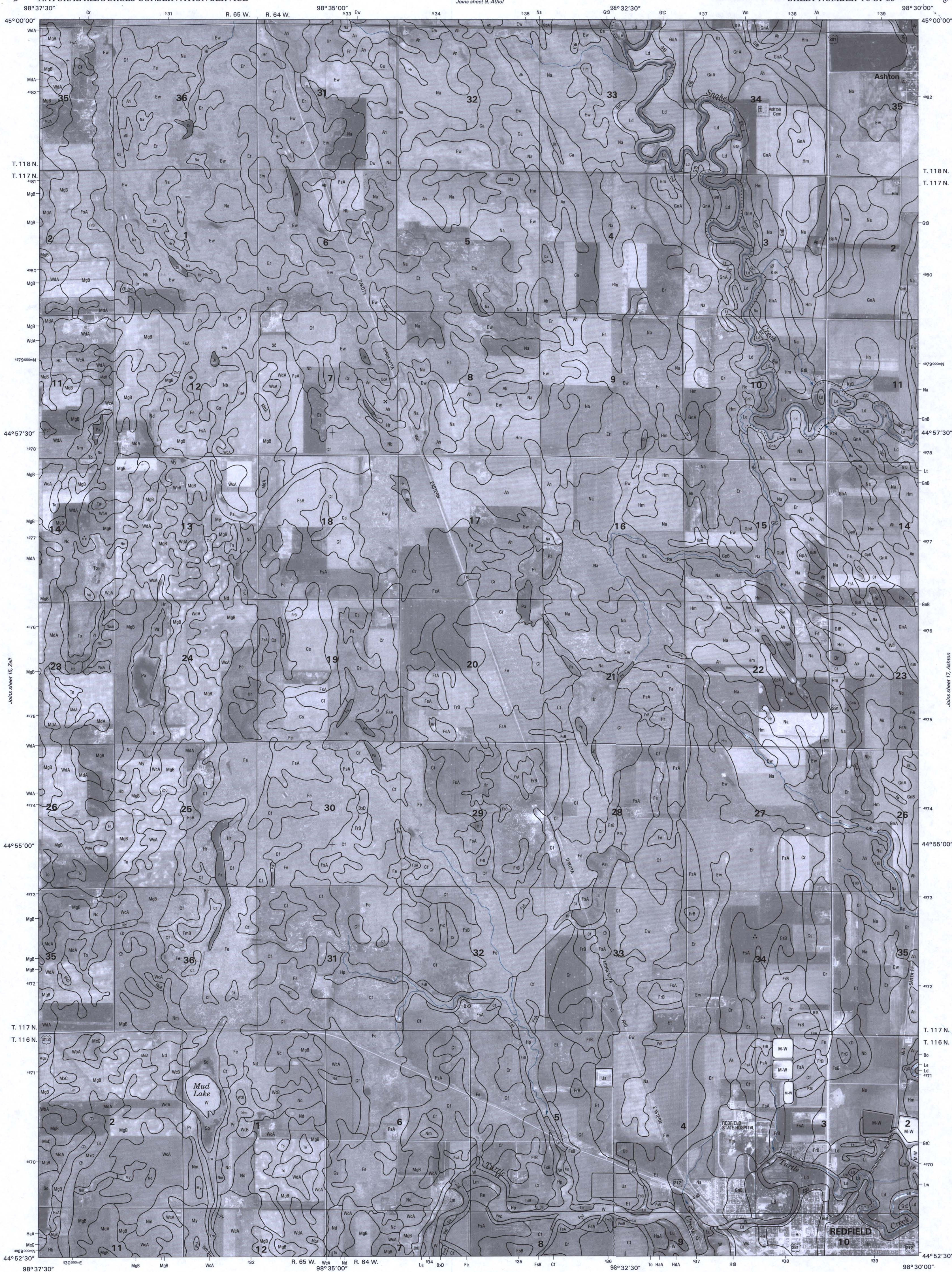


NORTH



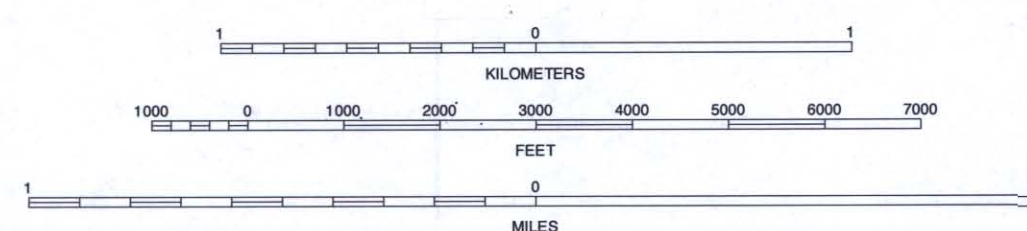
QUADRANGLE LOCATION

ZELL, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 15 OF 35

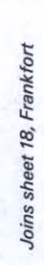


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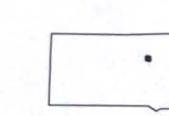
North American Datum of 1927 (NAD27), Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



REDFIELD NORTH, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 16 OF 35



North American Datum of 1927 (NAD27). Clarke 1866 Spheroid
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ASHTON, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 17 OF 35

QUADRANGLE LOCATION

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

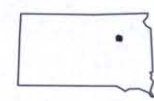
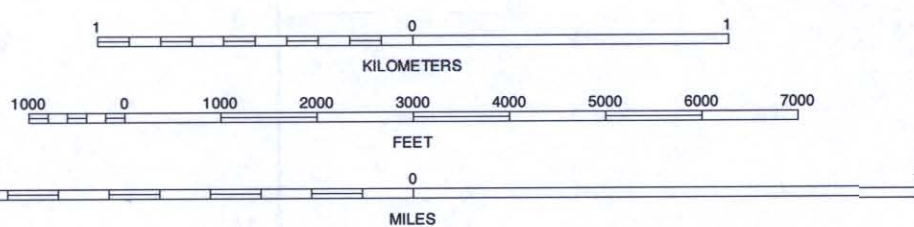
SPINK COUNTY, SOUTH DAKOTA
FRANKFORT QUADRANGLE
SHEET NUMBER 18 OF 35



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North American Datum of 1927 (NAD27), Clarke 1866 Spheroid 1000-meter ticks; Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION

FRANKFORT, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 18 OF 35

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SPINK COUNTY, SOUTH DAKOTA
DOLAND NW QUADRANGLE
SHEET NUMBER 19 OF 35

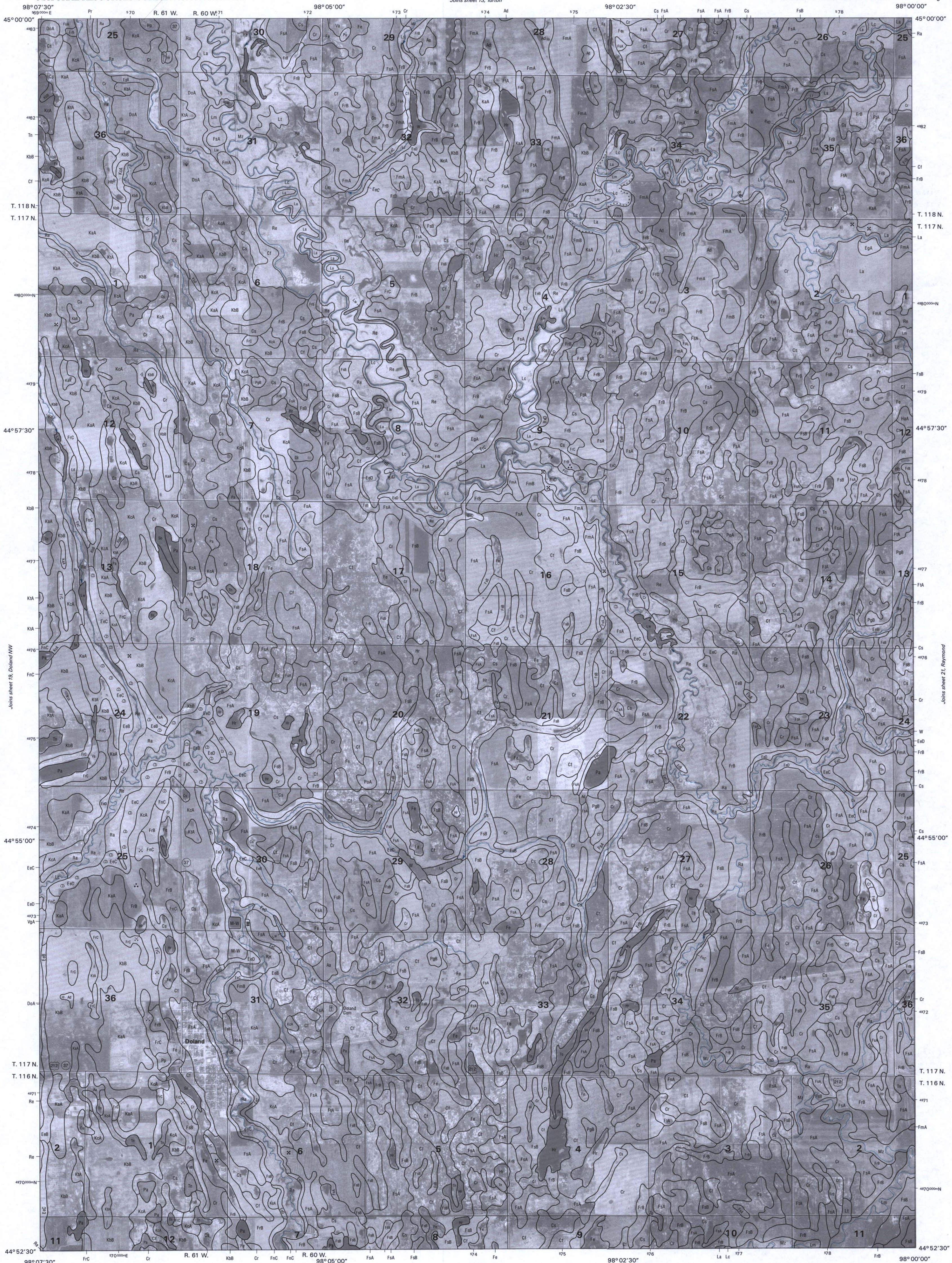


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North American Datum of 1927 (NAD27), Clarke 1866 Spheroid
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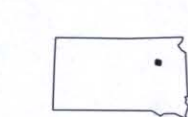
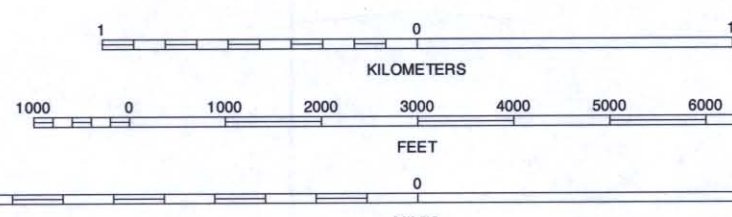
DOLAND NW, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 19 OF 35

QUADRANGLE LOCATION



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QUADRANGLE LOCATION

DOLAND, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 20 OF 35

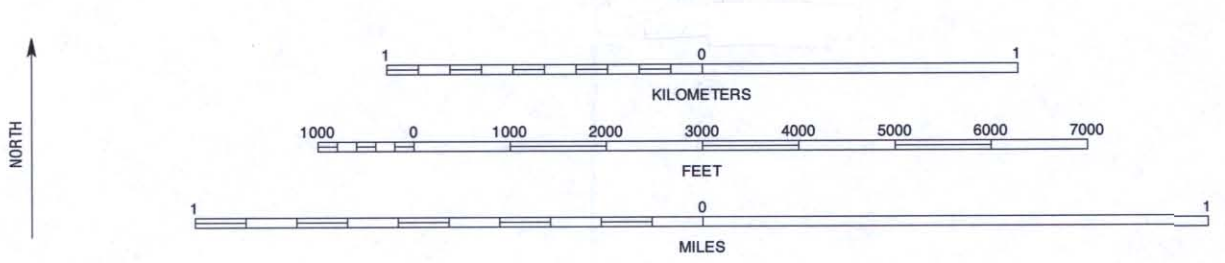
UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SPINK COUNTY, SOUTH DAKOTA
RAYMOND QUADRANGLE
SHEET NUMBER 21 OF 35



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North American Datum of 1927 (NAD27), Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



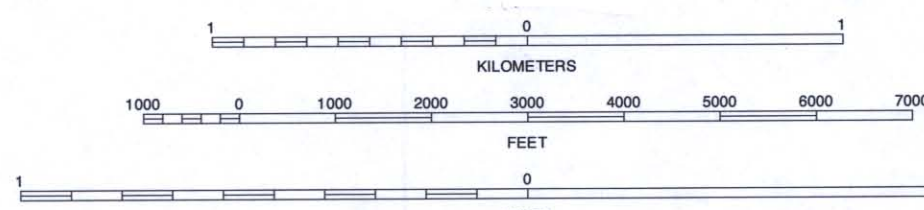
RAYMOND, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 21 OF 35



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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

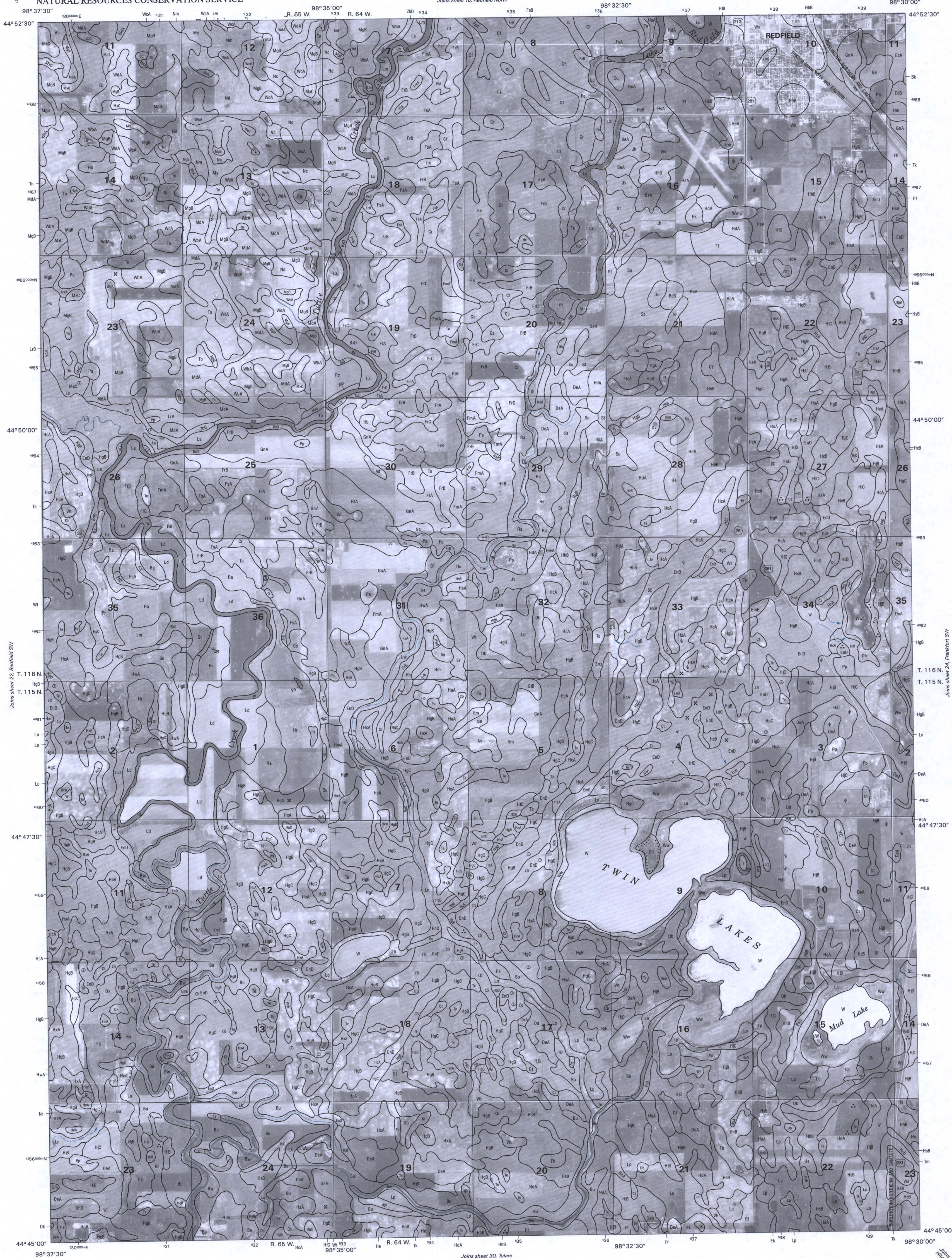


REDFIELD SW, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 22 OF 35

QUADRANGLE LOCATION

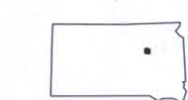
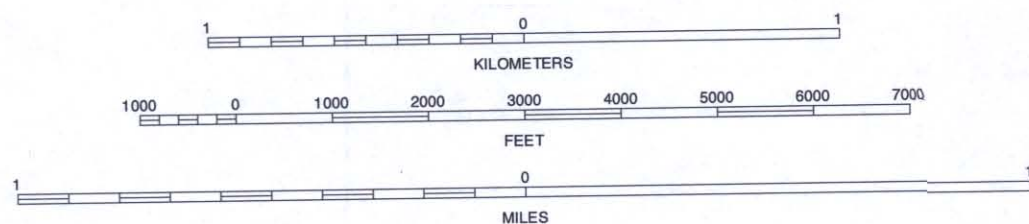
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NATURAL RESOURCES CONSERVATION SERVICE

SPINK COUNTY, SOUTH DAKOTA
REDFIELD SOUTH QUADRANGLE
SHEET NUMBER 23 OF 35



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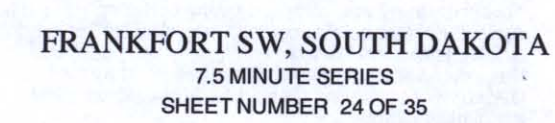
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QUADRANGLE LOCATION

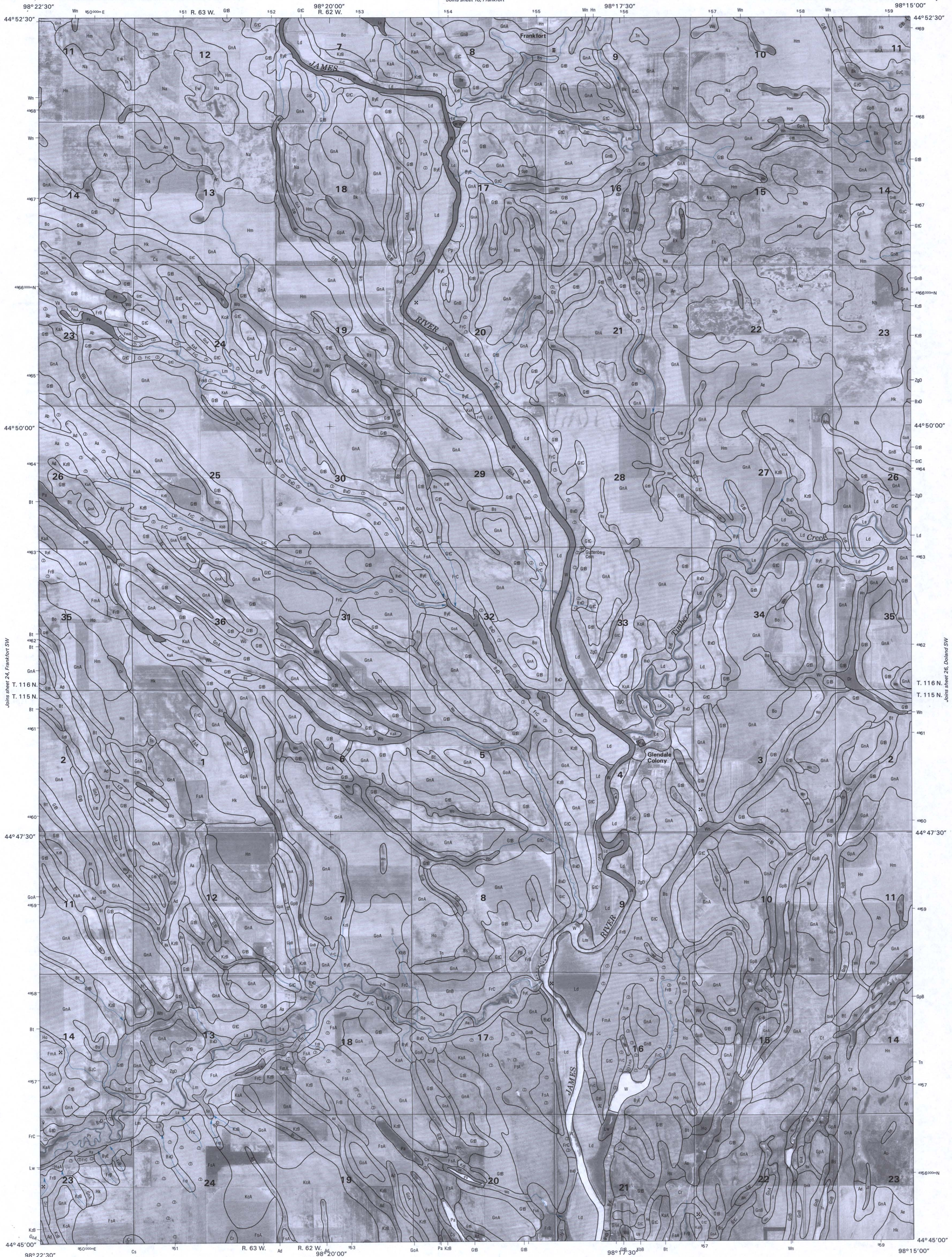
REDFIELD SOUTH, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 23 OF 35

SPINK COUNTY, SOUTH DAKOTA
FRANKFORT SW QUADRANGLE
SHEET NUMBER 24 OF 35



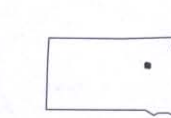
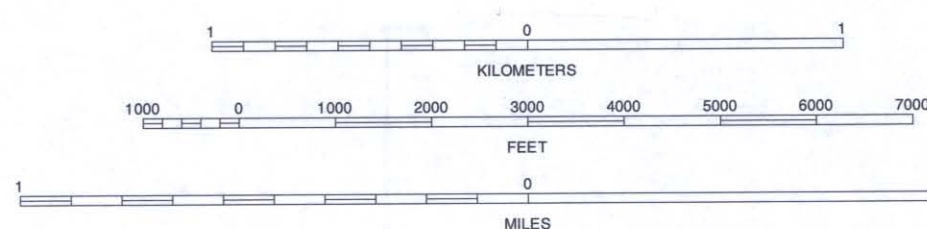
UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SPINK COUNTY, SOUTH DAKOTA
GLENDALE COLONY QUADRANGLE
SHEET NUMBER 25 OF 35



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North American Datum of 1927 (NAD27), Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUADRANGLE LOCATION

GLENDALE COLONY, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 25 OF 35

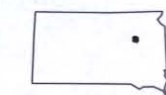
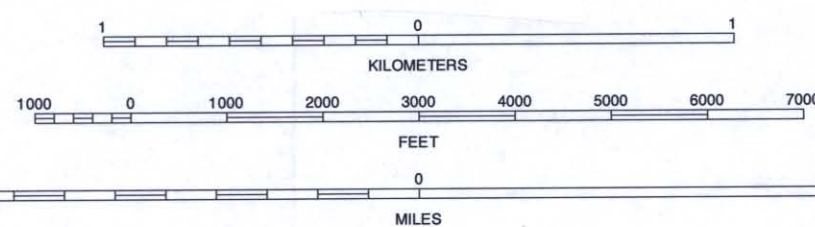
UNITED STATES
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NATURAL RESOURCES CONSERVATION SERVICE

SPINK COUNTY, SOUTH DAKOTA
DOLAND SW QUADRANGLE
SHEET NUMBER 26 OF 35



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North American Datum of 1927 (NAD27), Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUADRANGLE LOCATION

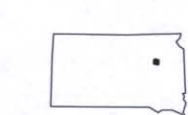
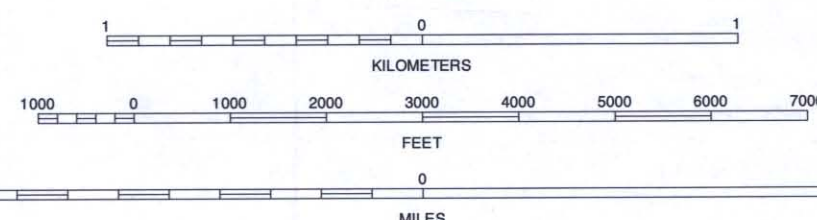
DOLAND SW, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 26 OF 35



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1984 aerial photography.

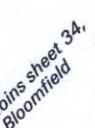
North American Datum of 1927 (NAD27), Clarke 1866 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 14.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

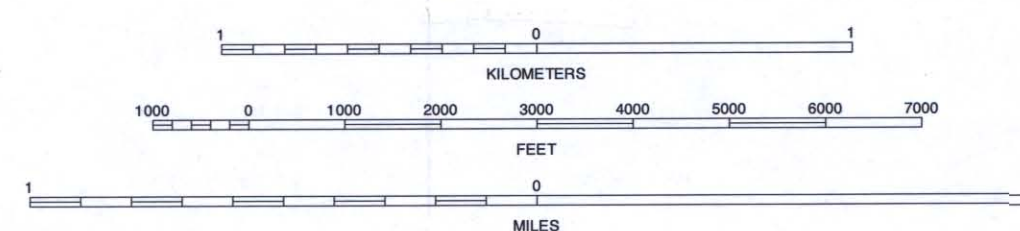


QUADRANGLE LOCATION

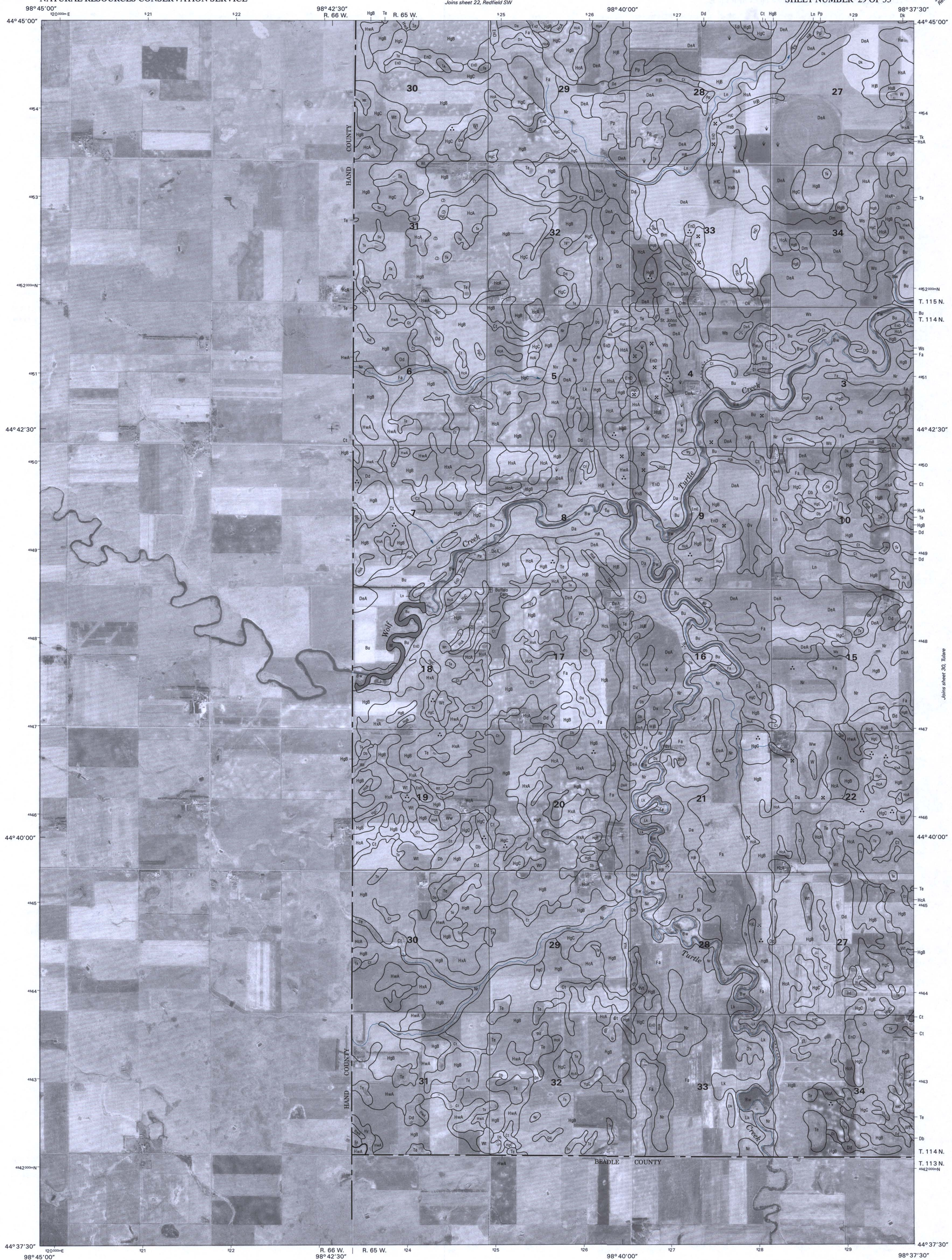
DOLAND SE, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 27 OF 35



North American Datum of 1927 (NAD27). Clarke 1866 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 14.
Coordinate grid ticks and land division data, if shown, are
approximately positioned. Digital data are available for
this quadrangle.



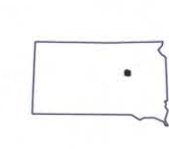
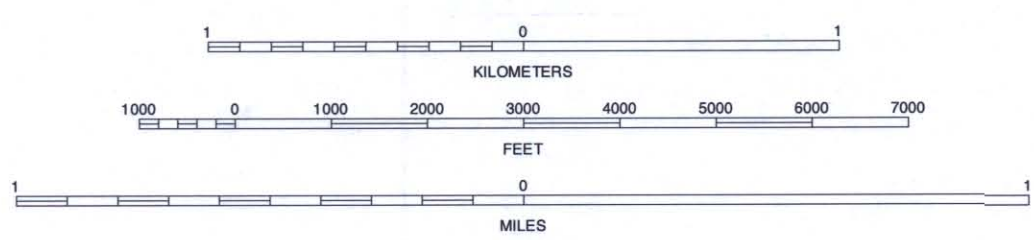
FORDHAM DAM, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 28 OF 35



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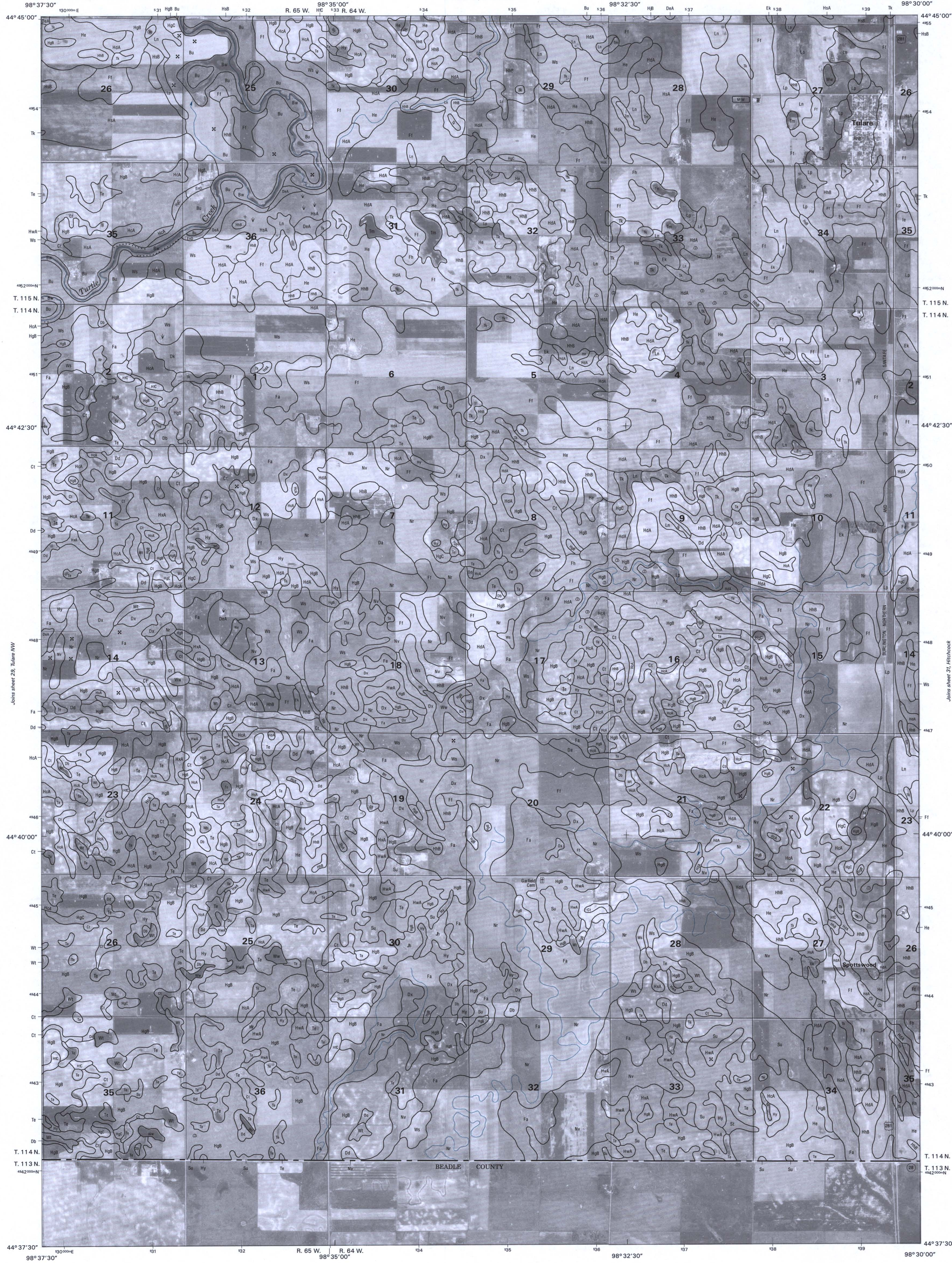
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NORTH



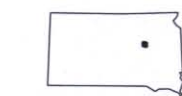
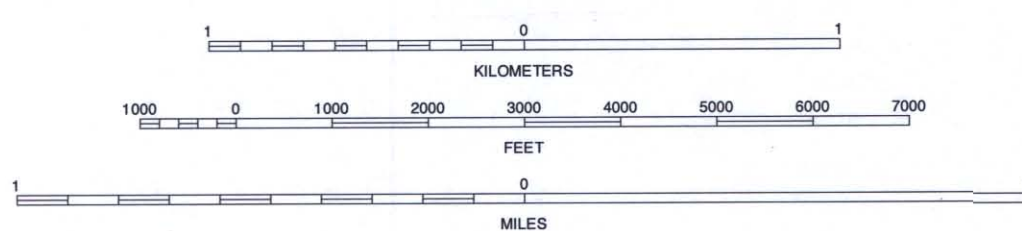
TULARE NW, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 29 OF 35

QUADRANGLE LOCATION



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North American Datum of 1927 (NAD27) Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

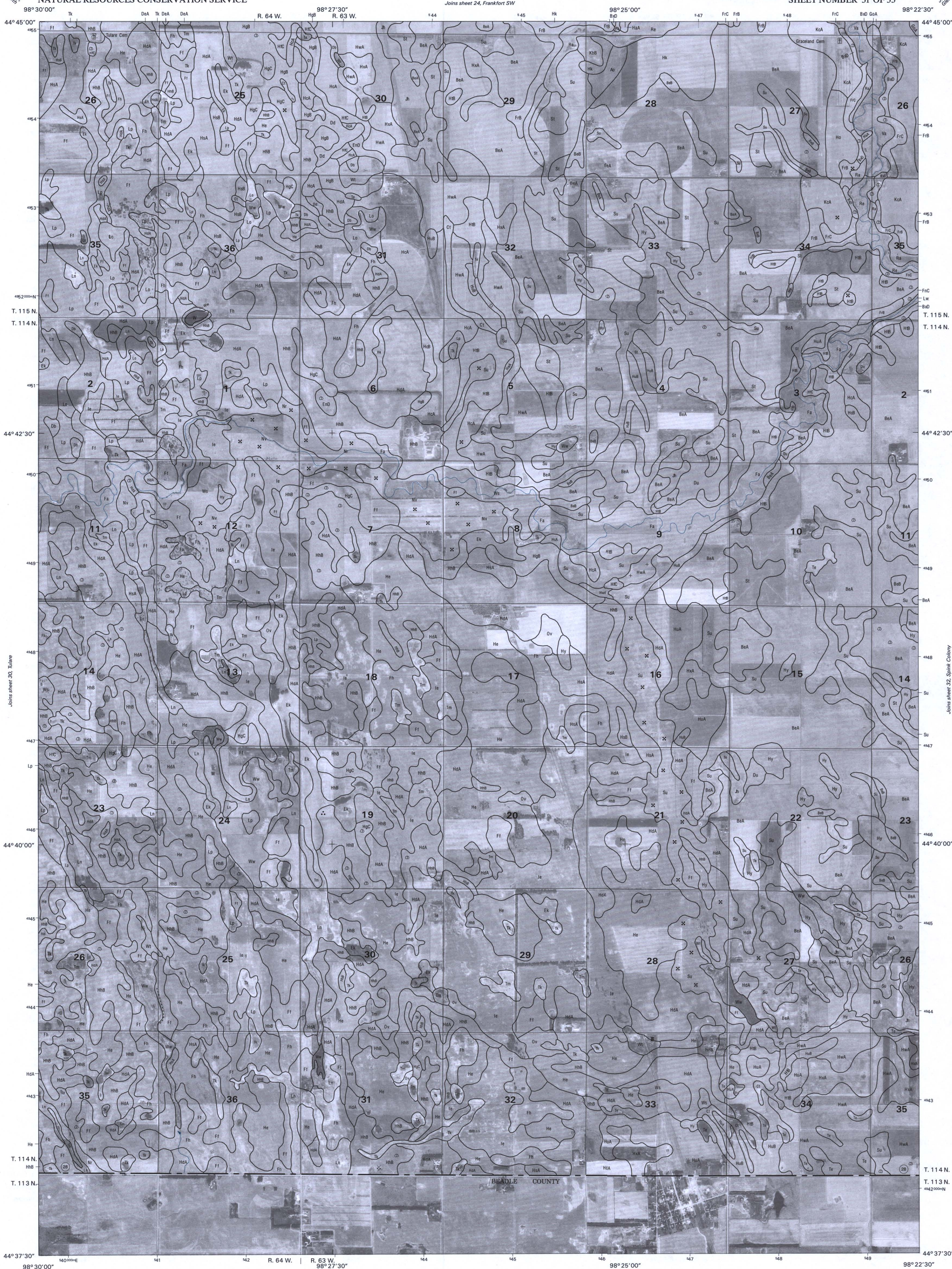


QUADRANGLE LOCATION

TULARE, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 30 OF 35

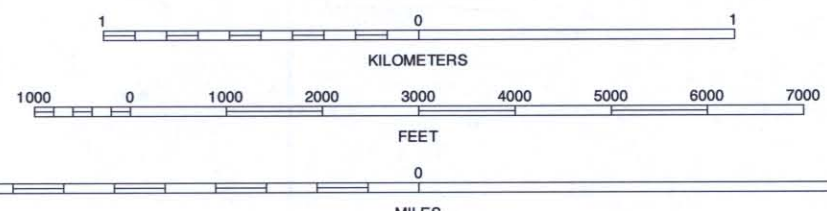
UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SPINK COUNTY, SOUTH DAKOTA
HITCHCOCK QUADRANGLE
SHEET NUMBER 31 OF 35



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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



HITCHCOCK, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 31 OF 35

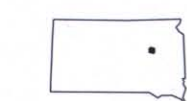
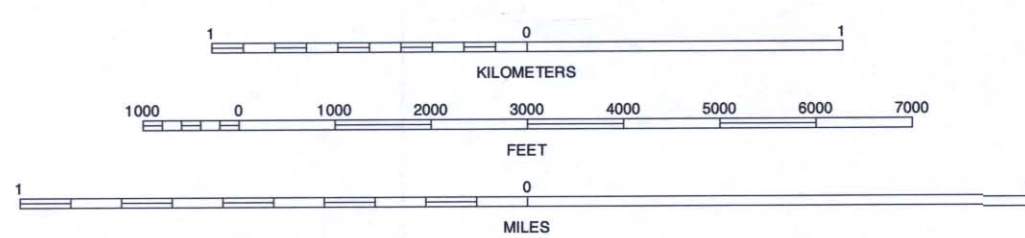
QUADRANGLE LOCATION



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North American Datum of 1927 (NAD27), Clarke 1866 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 14.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

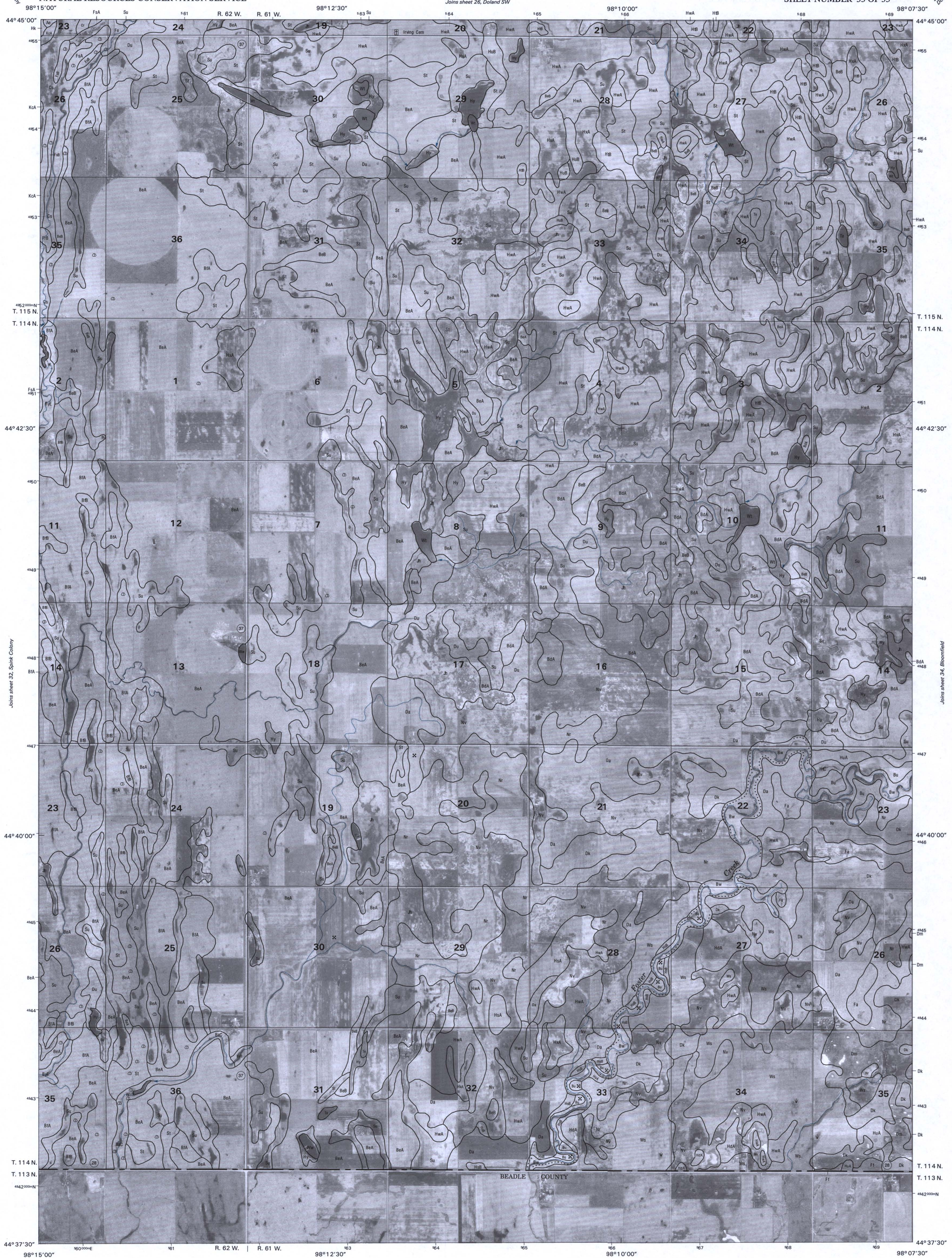


QUADRANGLE LOCATION

SPINK COLONY, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 32 OF 35

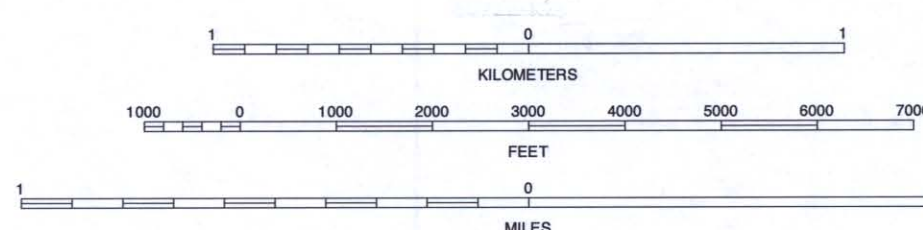
UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SPINK COUNTY, SOUTH DAKOTA
LAKE BYRON NW QUADRANGLE
SHEET NUMBER 33 OF 35



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North American Datum of 1927 (NAD27), Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUADRANGLE LOCATION

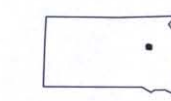
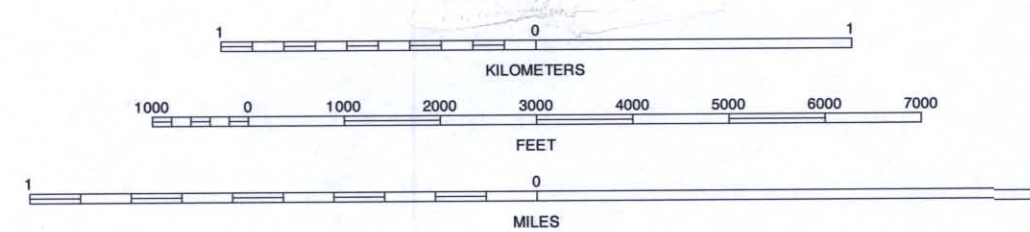
LAKE BYRON NW, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 33 OF 35



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North American Datum of 1927 (NAD27), Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION

BLOOMFIELD, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 34 OF 35

Joins sheet 22,
Doland SE

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

Joins sheet 28, Fordham Dam

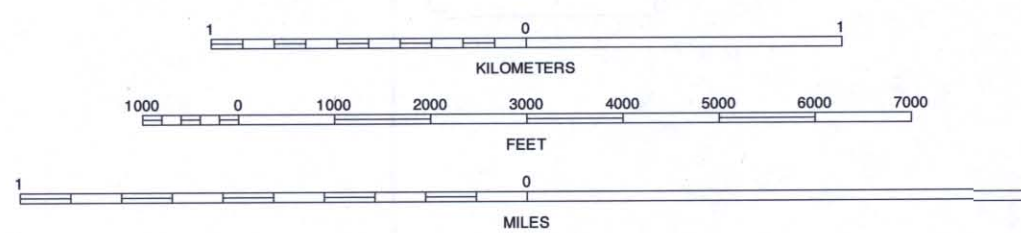
SPINK COUNTY, SOUTH DAKOTA
CARPENTER QUADRANGLE
SHEET NUMBER 35 OF 35



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North American Datum of 1927 (NAD27), Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION

CARPENTER, SOUTH DAKOTA
7.5 MINUTE SERIES
SHEET NUMBER 35 OF 35